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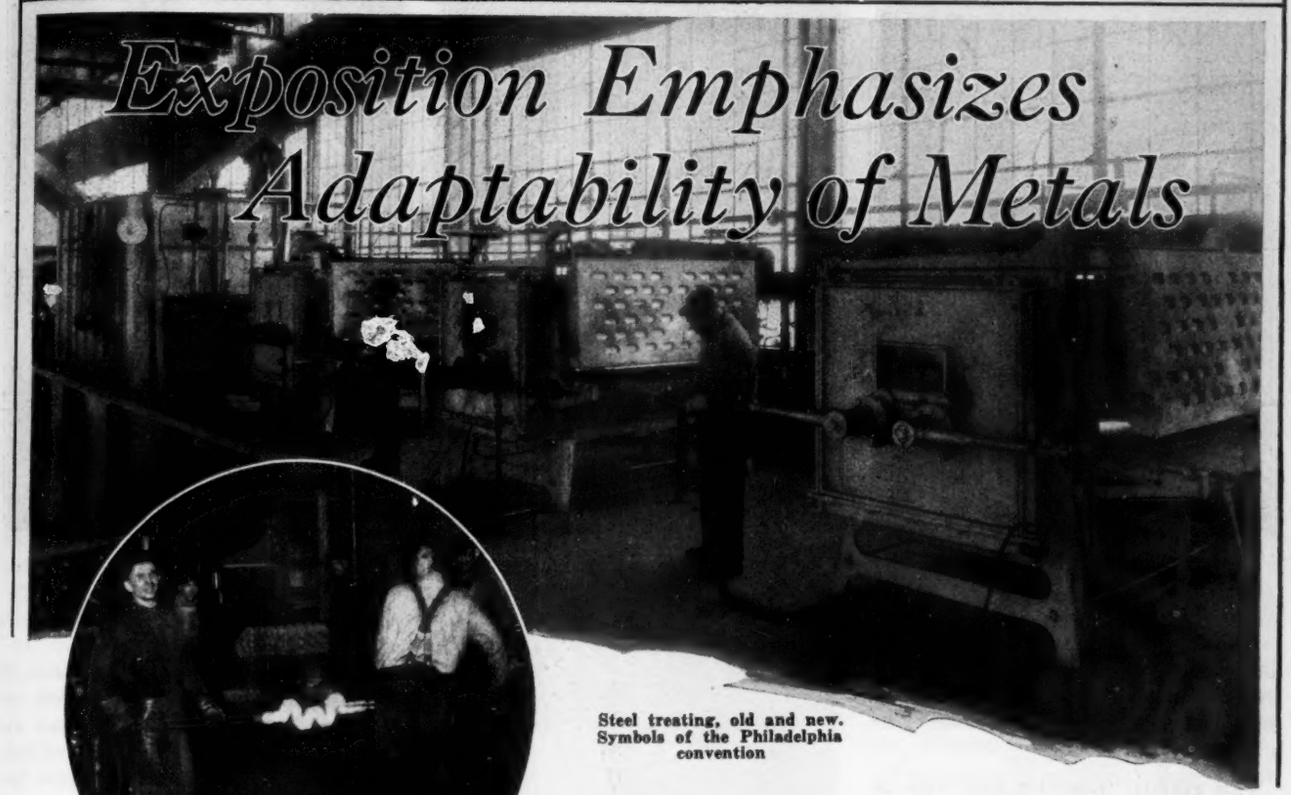
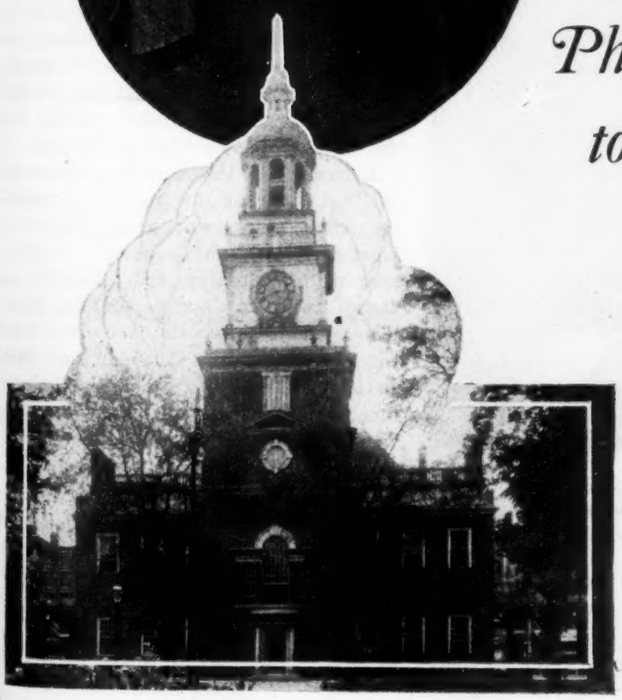
Exposition Emphasizes Adaptability of Metals



Steel treating, old and new. Symbols of the Philadelphia convention

Philadelphia Will Be Host to Army of Technicians

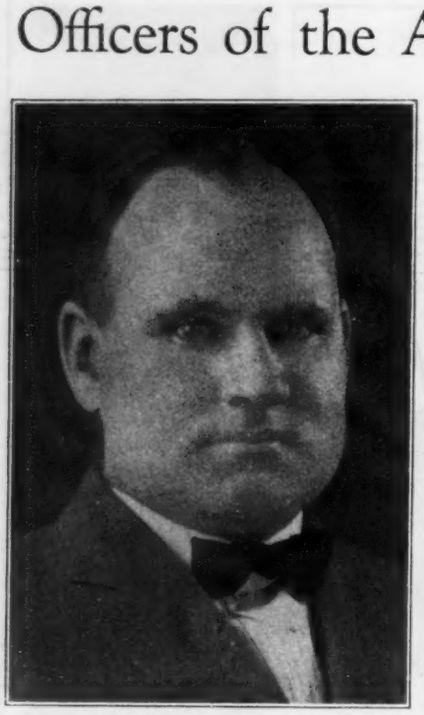


IN THIS age of marvelous scientific development it is easy to regard as commonplace accomplishments which, had they occurred even a quarter of a century ago, would have been considered of epoch-making importance. So fast is our pace in technical progress that true perspectives seldom come within our vision.

Fifty years ago the basic materials of industry were essentially the same as they are today. Iron, steel, nonferrous metals, wood, stone, etc., served our forefathers much as they serve us in 1928 with the exception, however, that today the requirements attending many of the applications of these materials are much more exacting. Comparatively few of the modern specifications could be met by the materials of 1878.

This statement is particularly true of steel, because while fine steels were being produced in the nineteenth century, they were largely the product of rule-of-thumb methods. Uniformity of quality, which now is so essential in the extensive use of an engineering material had not been achieved at that time. In fact one of the most dramatic phases of the development of metals during the past few decades is the refinement of equipment

Officers of the American Society for Steel Treating



ZAY JEFFRIES
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Secretary

and practice which have made possible the production of superfine alloys of steel, copper. brass and aluminum on a quantity basis.

This gradual transition from rule-of-thumb to scientific practice, with the resulting improvement in quality and increase in output brought important changes in the technical branches of the metal industries. As the application of alloys spread, producers were pressed by the users for information on the treatment of the product. The complex routine of heatings and quenchings made it necessary for makers and customers to co-operate as never before. And finally the interlacing interests of these two principals brought into prominence a third group—the treaters of metals. These technicians deserve much of the credit for the present amazing adaptability of the principal metals. Let someone design a new airplane detail, requiring a metal possessing an odd combination of properties, and within a surprisingly short time after the specifications are made known, metallurgists will find the appropriate alloy and prescribe the desired heat treatment. Likewise present a problem of fabrication and immediately some one in the great army of engineers will offer the solution in terms of forging, stamping, casting, machining, welding, riveting, or other operation.

The popular conception of modern industry emphasizes the role of machinery and labor saving equipment and either discounts or ignores the important contributions made by metallurgists, engineers and others to the refinement of metals. It should be clear to every thoughtful person that few, if any, of the machine tools, jigs, dies, conveyors, furnaces and countless other items of equipment constituting the "plant" of industry in this machine age would exist in their present state of development if it were not for the availability of appropriate steel and nonferrous alloys. The advances in the making, treating and application of these alloys—not only in quality but also in quantity—represents an achievement just as important, if not as dramatic, as that which has placed the United States ahead of other nations in the use of mechanical equipment.

In view of the common character of their service to industry, metallurgists, engineers and executives identified with the making, treating, shaping, fabrication and assembly of metal confront many similar problems. Their interests are interlaced to such an extent that it has been found profitable to hold the annual meetings of their technical societies concurrently and in the same city.

During the week of Oct. 8, many engaged in the service of metals will participate in the conventions at Philadelphia of the American Society for Steel Treating, the American Welding society and the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers.

* * *

THE occasion of this approaching meeting in Philadelphia arouses memories of an earlier gathering in that city. Eight years ago, on Sept. 14, 1920, two young technical societies founded independently but hav-

ing a common purpose convened in the city of Philadelphia to join hands and resources for undertaking larger tasks. The two young organizations were the American Steel Treaters' society and the Steel Treating Research society and the name chosen for the new order was the American Society for Steel Treating.

The membership of the new association was approximately 2000 with chapters in 27 cities. Today, the American Society for Steel Treating has a membership of close to 5000 and maintains 37 chapters, or local groups. In the eight years intervening between the two visits to Philadelphia, the American Society for Steel Treating has advanced itself to top rank among American technical societies.

So successful has the society been with its conventions and expositions that nation-wide recognition is given to National Metal Week and the National Metal Exposition. To take advantage of the opportunity for visiting the exposition, two other technical societies for the second consecutive year are holding meetings coincident with those of the American Society for Steel Treating. As was the case at Detroit last year, the American Welding society and the Institute of Metals, division of the American Institute of Mining and Metallurgical Engineers, are conducting simultaneous sessions in Philadelphia devoted to the making, treating and working of metals and their alloys. Further, the American Welding society is sponsoring a welding and cutting exposition as one section of the National Metal exposition in Commercial Museum.

All three societies have arranged most complete programs for their convention and invite the members of the other societies to attend. The American Society for Steel Treating will have headquarters at the Benjamin Franklin hotel and there will conduct technical sessions each morning from Monday to Friday. Afternoon sessions on each of these days will be held at Commercial Museum, an arrangement which will enable members to spend considerable time in inspecting the exhibits. The annual business meeting is scheduled for Wednesday morning and will be followed immediately with the Campbell memorial lecture which this year will be delivered by Dr. W. H. Hatfield, Brown-Firth Research Laboratories, Sheffield, Eng.

Fifteen inspection trips to steel plants and manufacturing establishments have been arranged—three for Tuesday morning, three for Wednesday morning, three for Thursday morning and two for Friday morning. Four other plants are open for inspection at the convenience of the visitors. These visitations, which are described on Page 764, will be participated in by the members of all three societies.

Entertainment features of the Steel Treaters' program include a ball at the Benjamin Franklin hotel at 9:30 p. m. on Tuesday and the annual banquet at the same hotel on Thursday evening at 6:30 p. m. Members of the other societies have been invited to these functions. One of the features of the banquet will be the award of the Henry Marion Howe gold medal to the author of the best paper published in *Transactions* during the past year.

Sessions of the American Welding society are to be held at the Bellevue-Stratford hotel. As shown by the complete program appearing on Page 761, Monday will be devoted to registration and a meeting of the board of directors. Technical sessions have been scheduled for Tuesday morning and afternoon, Wednesday morning, Thursday afternoon and Friday morning. The American Bureau of Welding, the research department of the society, will hold its meeting on Friday afternoon. Prof. C. A. Adams, Harvard Engineering school, Cambridge, Mass., director of the bureau, will preside.

Inspection trips to the arc welded building of the General Electric Co., the E. G. Budd Mfg. Co. and an airplane manufacturing plant have been arranged tentatively for Wednesday afternoon. Those attending the convention will participate with the American Society for Steel Treating in the grand ball at the Benjamin Franklin hotel on Tuesday evening. The annual banquet and dance of the Welding society will be at the Bellevue-Stratford hotel on Thursday evening.

The Institute of Metals has chosen for its headquarters the Benjamin Franklin hotel and technical sessions will be held there on Tuesday morning and Thursday morning. A session on Wednesday afternoon is to be held jointly with the American Society for Steel Treating at Commercial Museum. Members will attend the ball of the Steel Treaters at the Benjamin Franklin hotel on Tuesday evening. The annual dinner of the institute will be served at the same hotel on Wednesday

Condensed Program of A. S. S. T.

Monday, Oct. 8

10:00 a.m.—Technical session, Benjamin Franklin hotel.
12:00 m.—Registration, Commercial Museum.
12:00 m.-10:00 p.m.—Exposition open.
2:30 p.m.—Technical session, Commercial Museum.

Tuesday, Oct. 9

9:30 a.m.—Plant visitation.
10:00 a.m.—Technical session, Benjamin Franklin hotel.
12:00 m.-6:00 p.m.—Exposition open.
2:30 p.m.—Technical sesion, Commercial Museum.
9:30 p.m.—Grand ball, Benjamin Franklin hotel.

Wednesday, Oct. 10

9:30 a.m.—Plant visitation.
9:30 a.m.—Annual business meeting, Benjamin Franklin hotel.
10:30 a.m.—Campbell Memorial lecture Benjamin Franklin hotel.
12:00 m.-10:00 p.m.—Exposition open.
2:30 p.m.—Joint technical session with Institute of Metals, Commercial Museum.

Thursday, Oct. 11

9:30 a.m.—Plant visitation.
10:00 a.m.—Technical session, Benjamin Franklin hotel.
12:00 m.-6:00 p.m.—Exposition open.
2:30 p.m.—Technical session, Commercial Museum.
6:30 p.m.—Annual banquet, Benjamin Franklin hotel.

Friday, Oct. 12

9:30 a.m.—Plant visitation.
10:00 a.m.—Technical session, Benjamin Franklin hotel.
12:00 m.-10:00 p.m.—Exposition open.
2:30 p.m.—Technical session, Commercial Museum.

evening. The principal speakers will be Dr. F. M. Becket, vice president, Union Carbide & Carbon Co., New York, his subject being, "Chromium Alloys." The detailed program for the institute is found on Page 762.

The National Metal exposition will be housed in Commercial Museum and will require 80,000 feet of exhibit space. Exhibitors will total more than 160. Approximately 10,000 square feet of the space has been set aside for the welding and cutting exposition arranged under the direction of the American Welding society. Another large section is reserved for the display of electric furnaces, while a third section will be devoted to furnaces designed for gas firing and numerous types of appliances adapted to gas burning.

Steel Treater Program and Technical Papers

Monday, Oct. 8

MORNING

10:00 a. m.—Meeting in ballroom, Benjamin Franklin hotel. Chairman: R. M. Bird, Midvale Co., New York.
"An Investigation of the Physical Properties of Certain Chromium-Aluminum Steels," by Frank R. Lounsberry and Walter R. Breeler, Atlas Steel Corp., Dunkirk, N. Y.

10:30 a. m.—"Chromium-Copper Steels as Possible Noncorrosive Ferrous Alloys," by B. D. Saklatwalla and A. W. Demmler, Vanadium Corp. of America, Bridgeville, Pa.

11:00 a.m.—"A New Development in Corrosion-Resisting Steel," by F. R. Palmer, Carpenter Steel Co., Reading, Pa.

11:30 a. m.—"Stainless Iron and Its Application to the Manufacture and Transportation of Nitric Acid," by W. M. Mitchell, Central Alloy Steel Corp., Massillon, O.

AFTERNOON

2:30 p. m.—Meeting in assembly room, Commercial Museum. Chairman: A. E. White, University of Michigan, Ann Arbor, Mich.
"Surface Hardening of Special Steels with Ammonia Gas Under Pressure," by Raymond H. Holbrock, engineering experiment station, Purdue university, Lafayette, Ind.

3:00 p. m.—"Methods of Approximating Certain Physical Characteristics of Nitrided Steel Cases," by G. M. Eaton, Molybdenum Corp. of America, Pittsburgh.

3:30 p. m.—"Depth and Character of Case Induced by Mixtures of Ferroalloys with Carburizing Compounds," by E. G. Mahin, University of Notre Dame, Notre Dame, Ind., and R. C. Spencer, Caterpillar Tractor Co., Moline, Ill.

4:00 p. m.—"Solubility of Carbon in Normal and Abnormal Steels," by O. E. Harder, University of Minnesota, Minneapolis, and W. S. Johnson, American Rolling Mill Co., Middletown, O.

Tuesday, Oct. 9

MORNING

9:30 a. m.—Plant inspection.

10:00 a. m.—Meeting in ballroom, Benjamin Franklin hotel. Chairman: J. A. Mathews, Crucible Steel Co. of America, New York.
"The Equation of the Carbon Time Curve in Basic Open-Hearth Refining and Prediction of the Carbon Drop," by A. L. Feild, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.

10:30 a. m.—"A Melting Record of Three Acid Open-Hearth Heats," by W. E. Griffiths, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y., and C. E. Meissner, Chrome Steel Co., Carteret, N. J.

11:00 a. m.—"Manufacture of Acid Open-Hearth Steel for Forging Ingots," by H. P. Rassbach, Midvale Co., Philadelphia.

11:30 a. m.—"Deoxidation of Steel with Silicon," by Dr. C. H. Herty Jr., and G. R. Fitterer, bureau of mines, Pittsburgh.

AFTERNOON

2:30 p. m.—Meeting in assembly room, Commercial Museum. Chairman: T. D. Lynch, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
"Graphitization in the Presence of Nickel," by H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

3:00 p. m.—"Influence of Nickel on Combined Carbon in Gray Iron," by J. R. Houston, Harnischfeger Corp., Milwaukee.

3:30 p. m.—"Some Characteristics of Pearlite in Eutectoid Rail Steels," by O. V. Greene, Reading Co., Reading, Pa.

4:00 p. m.—"Cutting Qualities of an Alloy Steel as Influenced by Its Heat Treatment," by O. W. Boston, University of Michigan, Ann Arbor, Mich., and M. N. Landis, Landis & Landis, Chicago.

Wednesday, Oct. 10

MORNING

9:30 a. m.—Plant inspection.

9:30 a. m.—Annual business meeting in ballroom, Benjamin Franklin hotel. Chairman: F. G. Hughes, New Departure Mfg. Co., Bristol, Conn.

10:30 a. m.—Campbell Memorial lecture. Chairman: Dr. G. K. Burgess, bureau of standards, Washington.
"The Application of Science to the Steel Industry," by Dr. W. H. Hatfield, Brown-Firth Research Laboratories, Sheffield, England.

AFTERNOON

2:30 p. m.—Meeting in assembly room, Commercial Museum. Chairman: Dr. Zay Jeffries, Aluminum Co. of America, Cleveland.
"Notes on Smoothing and Etching," by H. B. Pulsifer, Beryllium Corp. of America, Cleveland.

3:00 p. m.—"Further Observations on the Microstructure of Martensite," by F. F. Lucas, Bell Telephone Laboratories, New York.

3:30 p. m.—"Treatment and Structure of Magnesium Alloys," by J. A. Gann, Dow Chemical Co., Midland, Mich.

4:00 p. m.—"Neumann Bands in Ferrite," by C. H. Mathewson, Yale university, New Haven, Conn.

4:30 p. m.—"A Study of the Constitution of High Manganese Steels," by V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh.

Thursday, Oct. 11

MORNING

9:30 a. m.—Plant inspection.

10:00 a. m.—Meeting in ballroom, Benjamin Franklin hotel. Chairman: Dr. Albert Sauveur, Harvard university, Cambridge, Mass.
"On Oxygen Dissolved in Steel and Its Influence on the Structure," by M. A. Grossmann, Central Alloy Steel Corp., Canton, O.

10:30 a. m.—"Surface Cooling of Steels in Quenching," by H. J. French, G. S. Cook and T. E. Hamill, bureau of standards, Washington.

11:00 a. m.—"Tungsten Carbide, a New Tool Material," by S. L. Hoyt, General Electric Co., Schenectady, N. Y.

11:30 a. m.—"Austenite Decomposition and Length Changes in Steel," by E. C. Bain, United States Steel Corp., Kearny, N. J., and Willis S. N. Waring, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.
"On the Nature of Martensite Crystals," by Dr. Kotaro Honda, Tohoku Imperial university, Sendai, Japan (By title.)

AFTERNOON

2:30 p. m.—Meeting in assembly room, Commercial Museum. Chairman: J. F. Harper, Allis-Chalmers Mfg. Co., Milwaukee.
"Torsional Modulus of Carbon Steel, Phosphor Bronze, Brass and Monel Metal," by W. P. Wood, University of Michigan, Ann Arbor, Mich.

3:00 p. m.—"Silicon-Manganese Steels with Chromium Additions for Engineering Applications," by A. B. Kinzel, Union Carbide & Carbon Research Laboratories Inc., Long Island City, N. Y.

3:30 p. m.—"Evaluation of the Stability of Metals at Elevated Temperatures from Expansion and Short-Time Tensile Test Data," by Dr. A. E. White and C. L. Clark, University of Michigan, Ann Arbor, Mich.

4:00 p. m.—"Cloudburst Process for Hardness Testing and Hardening," by E. G. Herbert, Edward G. Herbert Ltd., Manchester, England.

Fiday, Oct. 12

MORNING

9:30 a. m.—Plant inspection.

10:00 a. m.—Meeting in ballroom, Benjamin Franklin hotel. Chairman: Bradley Stoughton, Lehigh university, Bethlehem, Pa.
"Metallurgical Problems of Transmission Gearing," by Ernest F. Davis, Warner Gear Co., Muncie, Ind.

10:30 a. m.—"Decarburization of High-Carbon Steel in Reducing Atmospheres," by J. J. Curran and J. H. G. Williams, Henry Souther Engineering Co., Hartford, Conn.

11:00 a. m.—"Service Annealing of Sling and Crane Chains," by W. J. Merten, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

11:25 a. m.—"High-Carbon, High-Chromium Steels," by J. P. Gill, Vanadium Alloys Steel Co., Latrobe, Pa.

12:00 a. m.—"Steel Failures in Aircraft," by F. T. Sisco, Wright field, Dayton, O.
"On the Equilibrium Diagram of the Iron-Molybdenum System," by Takeshi Takei and Takejiro Murakami, Tohoku Imperial university, Sendai, Japan. (By title.)

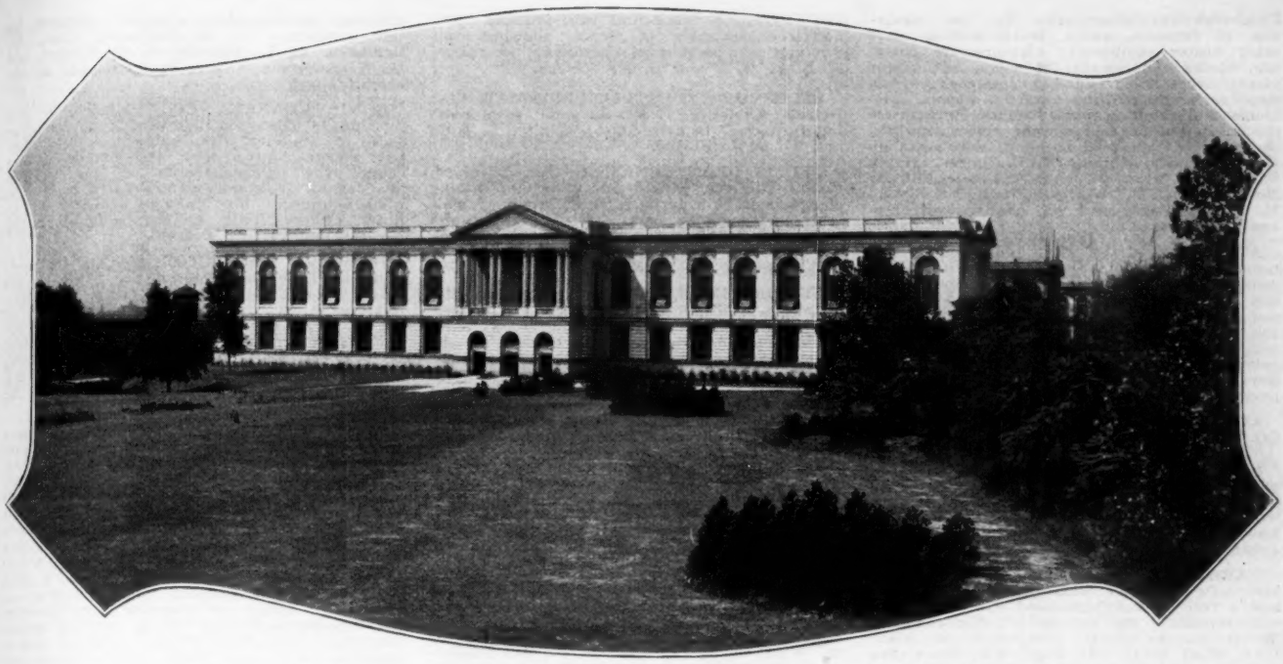
AFTERNOON

2:30 p. m.—Meeting in assembly room, Commercial Museum. Chairman: Prof. W. Trinks, Carnegie Institute of Technology, Pittsburgh.
"Effect of Furnace Atmospheres on Steels," by R. G. Guthrie, Peoples Gas Light & Coke Co., Chicago.

3:00 p. m.—"Progress Made in the Use of Electric Furnaces for Heat Treating," by A. N. Otis, General Electric Co., Schenectady, N. Y.

3:30 p. m.—"A New Method for Heat Treating High Speed Steel," by H. C. Knerr, consulting metallurgist, Philadelphia.

4:00 p. m.—"Heating High-Speed Steel to 2400 Degrees Fahr. in Molten Lead," by W. C. Searle, Leland Gifford Co., Putnam, Conn.



Commercial Museum, Philadelphia, where National Metal Exhibition will be held

Metal Exposition Will Feature Steel, Its Treating and Fabrication

EXHIBITORS to the number of 160 will display products in the 1928 National Metal Exposition in Commercial Museum. Total floor space will aggregate 80,000 square feet, of which about 10,000 square feet will be devoted to the welding and cutting exposition sponsored by the American Welding society. Another important section has been set aside for the showing of electric furnaces, while still another section has been reserved for gas operated furnaces and appliances. Much prominence will be given to steels and steel products, nonferrous alloys, heat treating furnaces, heat treating materials and cleaning compounds, welding equipment and welded products, heat control apparatus and a wide range of testing devices. The exposition will be open each day from Monday to Friday, inclusive, the hours being from 12 m. to 10 p. m. on Monday, Wednesday and Friday and from 12 m. to 6 p.m. on Tuesday and Thursday.

Exhibitors List Products To Be Displayed

ABRASIVE CO., Philadelphia—Will demonstrate grinding wheel on a 16-inch swing-frame grinder running at high speed and display grinding wheels, segments, bricks and stones. R. A. Shaffer, S. M. Hershey, J. F. Fischer, H. O. Hunt, Earl Romary, W. A. Ruppel, I. R. Blair and W. E. Ilko will represent the company.

ACME ELECTRIC WELDER CO., Philadelphia—Will show, in operation 6-kilowatt spot welder; and nonoperating 35 kilowatt spot welder with a 48-inch throat; butt welding attachment. Attended by George M. Hessdoerfer.

AIR REDUCTION SALES CO., New York—Exhibit will include, in operation: Oxygen and acetylene in cylinders, oxygen discharge manifold, welding and cutting torches, regulators and supplies; the radiagraph, motor-driven and portable, for oxyacetylene cutting of steel; motor-driven tracing mechanism for following pattern or templets; first showing of device for reproduction cutting of shapes from steel plate; cam and magnet control of motor-driven following device. Representatives in attendance: W. W. Barnes, W. H. Eliason, A. T. Walker, D. C. Trout, W. L. Humphreys, H. B. Hand, C. S. Peters, W. H. Ludington, H. L. Rogers, A. H. Yock, Fred Judelsohn, F. E. Rogers, G. Van Alstyne and J. J. Crowe.

ALLEGHENY STEEL CO., Brackenridge, Pa.—Will exhibit samples of metal products and sheets, bars, tubes, etc., of high heat resistance. Representatives in attendance: C. B. Calomon, O. M. Otte, L. W. Hostettler and W. R. Murphy.

ALLEN, EDGAR, STEEL CO. INC., AND A. MILNE & CO., New York—See Milne, A., & Co., and Edgar Allen Steel Co. Inc.

AMERICAN BRASS CO., Waterbury, Conn.—Welding will be demonstrated and a complete line of copper alloy welding rods will be shown. W. H. Dowd, W. C. Swift, W. J. Maclean, John Becht, G. M. Hurlbut, J. H. Larmett, C. M. Saltsman and D. E. Hotchkiss will attend.

AMERICAN CAR & FOUNDRY CO., New York—An operating exhibit of electric rivet heater for heating rivets from ½ to 1⅛ inches in diameter and of any length from 1 to 7¾ inches; electric heater for heating the end or for heating at any spot on any length bar, giving a range of heat from 1 up to 8 inches for forging and upsetting purposes. F. C. Cheston and John S. Helt will be in attendance.

AMERICAN GAS FURNACE CO., Elizabeth, N. J.—Will exhibit a new, large size, rotary retort carburizing machine having a capacity of 1000 to 1250 pounds of work per charge; a small rotary carburizing machine, capacity 75 to 100 pounds of work; a large size vertical retort furnace, especially adapted for carburizing gears; thermosyphon heat exchange units; a large rotary retort type continuous heating machine, for reheating and hardening, capacity 750 to 1000 pounds per hour; and a reciprocating hearth-type unit with improved method of suspending the hearth slab. Rotary retort bath-type machines, rotary retort brass melters, oven furnaces for the annealing and hardening burners, and tip burners also will be on display. In attendance at the booth will be P. C. Osterman, John Mehrman, Gustav Schwab, Theodore Farwick Sr., Elmer C. Cook and F. W. Hornbruch.

AMERICAN METALLURGICAL CORP., Boston—Exhibiting in operation new models of electric furnaces, 10 x 18-inch round pot for lead, salt or cyanide; rectangular pot for lead, salt or cyanide; 24 x 48-inch box furnace for carburizing, hardening and annealing. Represented by: K. A. Juthe, S. N. Juthe, A. J. Hanson, John C. Juthe, A. B. Beach, L. A. Smith and A. D. Heath, E. E. Bolds and A. A. Anderson.

AMPCO TWIST DRILL CO., Jackson, Mich.—Exhibiting in operation two automatic drilling machines requiring approximately 50 square feet and weighing combined 10,000 pounds; display board of drills and reamers. Will be attended by: George Melling, Oscar Monrad, W. E. Loy, F. J. Sikorovsky, G. G. Chapman, David O'Brien and Mr. McCumber.

ARMSTRONG-BLUM MFG. CO., Chicago—This companay will exhibit in operation its metal band saw machine, high-speed hack saws, automatic high-speed saws, and high-speed edge hack saw blades. Harry J. Blum, G. L. Hunt and S. A. Woleben will have charge of the display.

ARMSTRONG BROS. TOOL CO., Chicago—Lathe, planer, and shaper tools, lathe dogs, clamps, ratchet drills, drop forged wrenches and pipe tools will be shown in operation in this company's booth. Horace Armstrong, A. Arbogast, S. Welter and G. L. Hunt will be in attendance.

ARMSTRONG CORK & INSULATION CO.,

Pittsburgh—Insulating brick for the insulation of furnaces, ovens, boiler settings, and other heater equipment; high-pressure covering, blocks and cement for steam and power plants, ovens, etc.; and cork covering for factory refrigerated lines such as brine, ammonia and drinking water; and corkboard for the insulation of cold storage rooms and for the roofs of industrial buildings will make up this company's exhibit. S. L. Barnes, H. B. Gates, E. C. Hawley John R. Livezey, M. A. Neely, F. L. R. Worley, Frank E. Blythe, H. J. Copestick and F. S. Wallace will represent the company.

ATKINS, E. C., & CO., Indianapolis—This company will exhibit in operation its No. 4 metal cutting band saw machine, power hack saw machine for production work, power hack saw machine for maintenanace or repair shop use, power hack saw blades, metal cutting slitting saws, circular and band saws for cutting wood and machine knives. Edward S. Norvell, L. C. Garvin and W. H. Sherer will have charge of the booth.

AUTOMATIC TEMPERATURE CONTROL CO. INC., Philadelphia—This company will show automatic temperature control equipment for gas, oil and electric furnaces of all types, most of which will be in actual operation on small gas heated furnaces. In attendance will be J. D. Andrews, G. S. Frazee, R. C. Lawlor, R. A. Smart, C. Wilhjelm and G. H. Johanson.

BARNES, W. O., CO. INC., Detroit—Power hack saw machines with light socket motors and a full line of high-speed steel hack saws will constitute the exhibit of this company. W. O. Barnes, J. H. Flavell, F. M. Shaw, C. B. Cecil, C. G. Van Tuyl, Wm. Gross, Roy Schindler and F. L. Robertson will represent the company.

BASTIAN-BLESSING CO., Chicago—Will show in operation oxyacetylene welding and cutting equipment; oxygen manifold; operating exhibit illustrating application of welding and cutting to ornamental iron industry; and acetylene generator in section showing construction and method of operation. In charge of E. L. Mills and E. N. Stevens.

BELLEVUE INDUSTRIAL FURNACE CO., Detroit—Exhibiting: Several small heat treating furnaces. In attendance: Walter E. Hinz and Louis J. Raymo.

BELLIS HEAT TREATING CO., Branford, Conn.—This company will have on display electric salt bath furnaces, heat treating small tools and machine parts, and hardening and tempering high-speed and carbon tool steels. A. E. Bellis, J. W. Black and R. C. Jordan will supervise the exhibit.

BETHLEHEM STEEL CO., Bethlehem, Pa.—Exhibit will include display of various grades of tool steels and stainless steel; alloy steels including an operating exhibit of silico-manganese spring steel; interesting types of forgings and castings; structural steel sections; and miscellaneous finished products illustrating the application of various grades of steels. In attendance will be R. S. Tucker, W. R. Shimer, Henry Wysor, A. P. Spooner, H. G. Walton, G. F. Hocker, D. C. Roscoe, E. A. Buxton, G. P. Witteman, H. C. Biggs, T. G. Foulkes, W. C. Hartman, A. McDonald, E. R. Long, W. B. Kennedy, J. H. Stoll, M. W. Dalrymple, W. E. Titus, W. S. Lippincott, H. E. Graffin, E. H. Jamison, H. R. Weeman, J. D. Codding and G. A. Cushman.

BIAX FLEXIBLE SHAFT CO., New York—Will show portable flexible shaft machines, flexible shafting, portable grinders, portable sanding machines, die sinking and rotary filing machines. Exhibit will be attended by R. Wezel, F. I. Vanderbeek, G. M. Vanderbeek, M. Buehler and Mr. Riter.

BLAKESLEE, G. S., & CO., Cicero, Ill.—Pump-type cleaning machines for cleaning metal stampings, screw machine parts and castings, also two types of cleaning methods with two different types of conveyors and spraying arrangements will be exhibited by this company. G. R. Blakeslee, John W. Dammers, A. T. Nogrady, A. S. Reichel and G. W. Anderson will be in attendance at the booth.

BOND, CHARLES, CO., Philadelphia—Exhibiting in operation improved type variable-speed transmission with double-block belt, electric remote control type and completely enclosed type. Demonstration of gas welding and cutting apparatus manufactured by Torch-weld Equipment Co. In attendance: W. A. Slack, Charles Irwin, C. Carter Bond, L. R. McKean and T. A. Bergen.

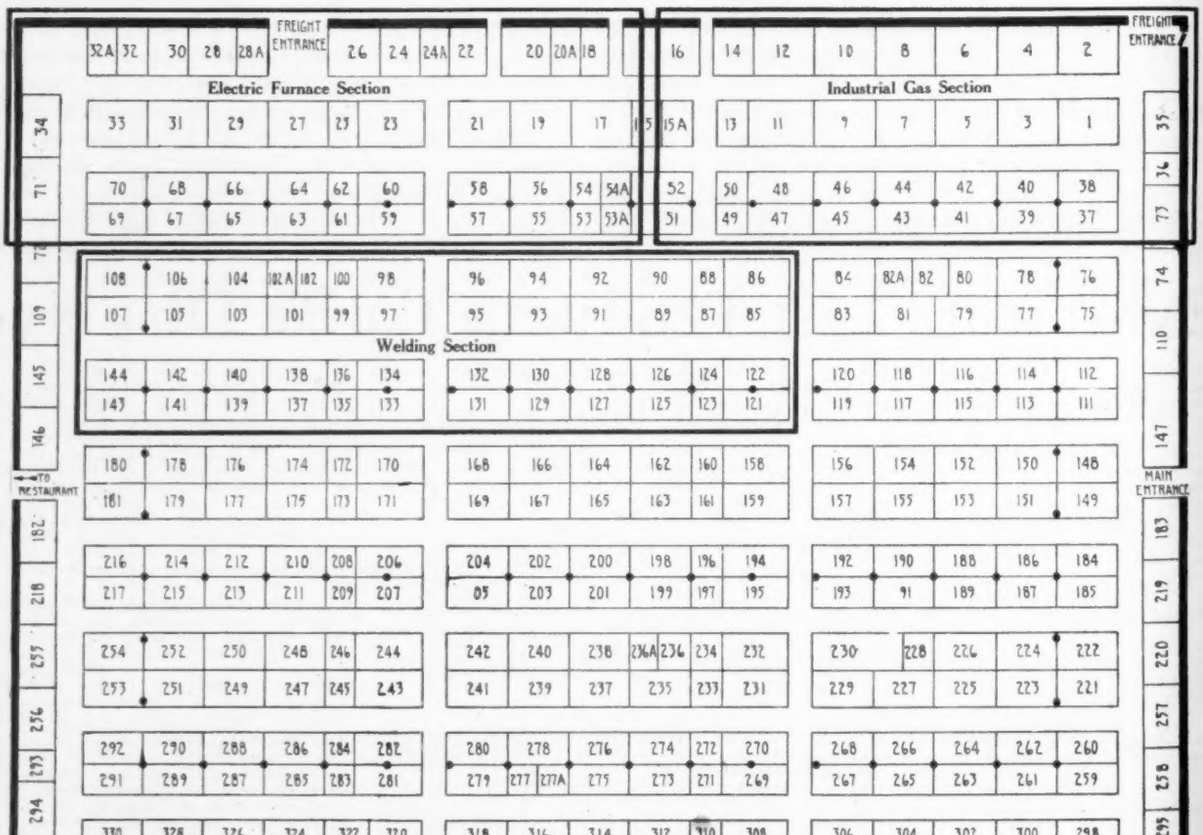
BOTFIELD REFRACTORIES CO., Philadelphia—Intricate structures of fire brick bonded with firebrick cement and other refractory mixtures, made by this company, will be shown at its exhibit. A gun for shooting refractory materials upon brick structures will be demonstrated. W. E. Smith, S. C. Lott, C. C. Phillips, W. E. Tierney, J. J. Sweeney and A. H. Engstrom will be in charge of the exhibit.

CAMPBELL, ANDREW C., INC., Bridgeport, Conn.—Three models of nibbling machines will be shown in actual operation by this company. No. 0 cuts steel up to 14 gage; No. 1-A cuts steel up to 3/16-inch gage; and the No. 2 machine cuts steel up to ⅜-inch gage. In attendance will be Stuart Naramore and J. Johnson.

CARBORUNDUM CO., Niagara Falls, N. Y.—This company's exhibit will include a general display of abrasive material such as crankshaft wheels for roughing and finishing, cam wheels, tool room wheels, internal grinding wheels, centerless wheels, polishing grains, abrasive paper and cloth. Representing the company will be S. F. Courter, W. J. Griffith, G. E. Chorman, Boyd Work, A. H. Prey, G. T. Kretschmar, E. C. Maguire, H. L. Henszey and J. F. Brady.

CARBORUNDUM CO., Perth Amboy, N. J.—An operating exhibit of a small electric fur-

Alphabetical List of Exhibitors Who Will Sho



nace equipped with nonmetallic heating elements to show visually the relative conductivity of silicon carbide, aluminum oxide and fireclay tile of the same size and thickness. On display also will be a model demonstrating method of applying radiant combustion chambers to car-type annealing furnaces; model of recuperator; model of wire annealing furnace; refractories for high temperature installations; insulating refractory firebrick and various grades of high temperature cements. C. E. Hawke, John G. Fritzinger, F. W. Miller, R. A. Beverley, C. A. Dutton and S. A. Fenno will be company representatives.

CELITE PRODUCTS CO., Los Angeles—Exhibit includes a complete line of heat insulation materials. A demonstration furnace will show the difference in the extent of heat radiation through insulated and solid firebrick constructions. High temperature cements and waterproofing compounds also will be shown. Fred H. Emerson, Angelo Gossman, Frank Coe, W. T. Hulsizer, Walter Kennedy and C. M. Smith will be in charge of the booth.

CENTRAL ALLOY STEEL CORP., Massillon, O.—Will exhibit early and modern automotive equipment; alloy steels; copper molybdenum iron; stainless irons; and nitralloy. In attendance will be B. F. Fairless, J. M. Schlendorf, C. C. Willits and M. J. R. Morris.

CHAR PRODUCTS CO., Indianapolis—This company's exhibit will include char carburizing compounds, carbon coated, preshrunk, and heat processed as designed for clean, reliable and economical carburizing practice. Special processing of the material whereby the energizing material is sealed within each particle by a protective coating or shell of pure carbon will be demonstrated. Annealing carbon, lead pot carbon and electrode carbon also will be on display. C. B. Edwards, C. Q. Swenson and William Higburg will supervise this exhibit.

CHICAGO PNEUMATIC TOOL CO., Philadelphia—An operating exhibit, including pneumatic and electric portable tools, drills, grinders, reamers, screw drivers, tapping machine, sanders; special exhibit of portable electric tools with frequency changer furnishing current, 220-volt, 3-phase, 180-cycles. Attended by: A. E. Goodhue, L. J. Walker, T. P. Harris and A. M. Brown.

Exposition Hours

Monday, Oct. 8—12:00 m. *to* 10:00 *p.m.*
Tuesday, Oct. 9—12:00 *m. to* 6:00 *p.m.*
Wednesday, Oct. 10—12:00 *m. to* 10:00 *p.m.*
Thursday, Oct. 11—12:00 *m. to* 6:00 *p.m.*
Friday, Oct. 12—12:00 *m.* 10:00 *p.m.*

CHROBALTIC TOOL CO., Detroit—This company will exhibit heat resisting, acid resisting and electrical resistance alloys; carburizing and annealing boxes, furnace parts, roller rails, furnace hearths, retorts, pusher plates, trays; also miscellaneous high-duty alloy castings. In attendance will be W. B. Sullivan, L. H. Whiteside, J. W. Mull Jr., A. A. Cash, C. M. Conner, E. A. Stifel, W. C. Voss and Louis C. Eitzen.

CLEVELAND TWIST DRILL CO., Cleveland—An operating exhibit of two high-speed drill presses demonstrating high-speed drills at various speeds and feeds; also a display of complete line of this company's products. H. P. Jenson, H. A. Baier, T. Skove, D. Burdett, H. G. Smith, F. M. Hoelzle, O. B. Hansen, G. Burkhardt. W. C. Weidig, R. G. Berrington, E. Horan and T. Thomas will be in attendance at the exhibit.

CLIMAX MOLYBDENUM CO., New York—Molybdenum ore as it occurs, together with the concentrates produced from the ore and all the forms in which it is prepared for use by the iron, steel and industrial trades will be exhibited by this company. The display includes various exhibits of commercial products employing molybdenum in their manufacture. In attendance at the booth will be B. F. Phillipson, F. C. Langenberg, J. B. Thorpe, W. P. Woodside, and R. L. Rolf.

CLIPPER BELT LACER CO., Grand Rapids, Mich.—An operating exhibit of the complete line of belt lacers, belt fasteners or hooks, belt cutters with safety feature and clipper connecting pins; several new articles such as 10-inch belt cutter and new speed lacer. Carl P. Field will be in charge of the exhibit.

COATS MACHINE TOOL CO. INC., New York—The complete line of gages made by the Krupp Steel Works of Germany; spring testing machine; micrometer fluid gage; hand tachometers; divided machine vises; and a scale preventive are included in this company's exhibit. Charles E. Coats is the company representative.

COLONIAL TOOL CO., Detroit—Will exhibit spline broaches, round hole broaches, square hole broaches, serration broaches, keyway broaches and connecting rod broaches in both push and pull types. Representatives will be J. W. Mull

Products at the Tenth National Metal Exposition

Exhibitor	Space No.
Abrasive Co.	152
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Air Reduction Sales Co.	129, 131
Allegheny Steel Co.	118
Allen, Edgar, Steel Co. Inc.	300
American Brass Co.	97
American Car & Foundry Co.	98
American Gas Furnace Co.	Gas section
American Machinist	15
American Metal Market	161
American Metallurgical Corp.	65, 66
Ampco Twist Drill Co.	244
Andresen & Associates Inc.	18
Armstrong-Blum Mfg. Co.	203
Armstrong Bros. Tool Co.	201
Armstrong Cork & Insulation Co.	24
Atkins, E. C., & Co.	220
Automatic Temperature Control Co. Inc.	174
Barnes, W. O., Co. Inc.	191
Bastian-Blessing Co.	128
Bellevue Industrial Furnace Co.	68
Bellis Heat Treating Co.	720
Bethlehem Steel Co.	111, 114
Biax Flexible Shaft Co.	286
Blakeslee, G. S., & Co.	299
Bond Co.	176
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Celite Products Co.	52
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Ford, J. B., Co.	229
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Halcomb Steel Co.	186, 188
Haynes Stellite Co.	143
Heppenstall Forge & Knife Co.	195
Hevi Duty Electric Co.	67
Hisey-Wolf Machine Co.	334
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Hoskins Mfg. Co.	69
Hydraulic Tool Works	310
Ideal Industrial Machinery	153
Illinois Tool Works	177
International Nickel Co. Inc.	219
Iron Age Publishing Co.	183
Iron Trade Review	79
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Jones & Laughlin Steel Corp.	230
Keller Mechanical Engineering Corp.	297, 298
Kelley, J. W., Co.	820
Kelley Reamer Co.	155
Kemp, C. M., Mfg. Co.	Gas section
Keystone Lubricating Co.	296
K-G Welding & Cutting Co. Inc	88
Lava Crucible Co. of Pittsburgh	19
Leeds & Northrup Co.	214, 215, 192, 193
Lincoln Electric Co.	132
Mahr Mfg. Co.	18
McCann Harrison Corp.	25
McGill Metal Co.	74
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Michigan Tool Co.	240
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Milne, A., & Co.	300
Milwaukee Die Casting Co.	198
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Pittsburgh Instrument & Machine Co.	284
Porter-Cable Machine Co.	333
Potts, Horace T., & Co.	166
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Pyrometer Instrument Co.	151
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Simonds Saw & Steel Co.	150
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Smith, David H., & Sons Inc.	223
Southern Manganese Steel Co.	154
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Williams, J. H., & Co.	226
Wilson-Maeulen Co. Inc.	78
Wilson Welder & Metals Co.	95

Officers of American Welding Society

C. A. ADAMS
Director, American Bureau of Welding

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President

C. A. MCCUNE
Treasurer

WILLIAM SPRARAGEN
Secretary, Bureau of Welding

Jr., T. A. Oleck, C. M. Conner, E. O. Jenkins, T. A. Meyer and Charles Peterson.

COOPER HEWITT ELECTRIC CO., Hoboken, N. J.—Will show in operation mercury vapor lighting; photographs and other data on typical installations. In attendance: C. F. Strebig, R. B. Chipman, W. R. Flounders, D. R. Grandy and L. F. Garisch.

CRUCIBLE STEEL CO. OF AMERICA, New York—Will exhibit various grades of high-speed steel, special machinery steel, alloy and carbon tool steel, cold-drawn specialties, stainless iron and steel, and noncorrosive steels. Representing the company will be B. F. Hufnagel, J. A. Matthews, A. T. Galbraith, J. M. McComb, H. L. Gellinger, R. Michener, R. E. Christie, W. K. Krepps, J. P. Jayne, E. P. Gaffney, R. H. Heatley, J. W. Barnett, F. J. Dawless, W. H. Plage, Allen Fraser and C. E. O'Connor.

DAILY METAL TRADE, Cleveland—At this booth will be available copies of publications of the Penton Publishing Co. and technical books. The space will be fitted up as a restroom and all who attend the exposition are cordially invited to make their headquarters here. Representatives will be C. J. Stark, E. L. Shaner, J. D. Pease, G. O. Hays, F. F. Light, E. C. Kreutzberg, E. F. Ross, J. D. Knox, H. R. Simonds, B. K. Price, and H. N. Pickett.

DARWIN & MILNER INC., Cleveland—Will exhibit a general line of high class alloy tool steel products; and a display of dies and tools demonstrating quantity production. Specialties made from patented steels developed by this company will be shown also. Victor Tlach, John C. Koch, John R. MacCracken and Charles F. Lear will be in attendance.

DEARBORN CHEMICAL CO., Chicago—Chemically compounded rust preventives and powdered and liquid cleaners will be exhibited by this company. In attendance will be E. M. Converse, C. A. Remsen and C. I. Loudenback.

DONNER STEEL CO. INC., Buffalo—Will present a display of cold-drawn material and parts made therefrom. Representatives will include W. F. Vosmer, J. W. Donner, A. G. Greenamyer, C. A. Cherry, H. G. Uphouse, E. D. Pumphrey, P. M. Guba, H. C. Richardson, R. E. Sherlock, W. C. Peterson, L. C. Miller, J. W. Percy, F. H. Lammert and N. F. Tisdale.

DRIVER-HARRIS CO., Harrison, N. J.—Will exhibit representative nickel-chrome and other alloy castings and sheet containers for heat resisting applications and other products of this company's manufacture. In attendance will be Joseph B. Shelby, W. E. Blythe, J. C. Bilek, Harry D. McKinney, Geo. A. Lennox and J. C. Henderson.

EASTMAN KODAK CO., Rochester, N. Y.—This company will present a display of X-ray negatives showing defects in materials. E. E. Smith will be in charge of the booth.

ECLIPSE FUEL ENGINEERING CO., Rockford, Ill.—Showing in operation: Steam boiler equipment; lead hardening furnace; high-speed steel furnace; automatic core oven burner; centrifugal blowers; display of pressure steel and pressed alloy pots; single and compound injectors, burners, burner tips, inspirator type burners, etc.; demonstrating unit for new type tunnel burners with cooling wells; and rivet heater. Attended by: O. M. Olsen, Walter Frederick, D. A. Campbell, J. M. Traugott, L. B. Maximon and G. W. McKee.

ELECTRIC FURNACE CO., Salem, O.—Electric heat treating furnaces and equipment for all purposes together with literature, information, and illustrations of unusual and interesting electric furnace installations will be shown by this company. Representatives are R. F. Benzinger, F. T. Cope, A. H. Vaughan, R. D. Thomas, E. P. Larkin, F. J. Peterson, S. Floyd Keener, T. B. Bechtel and N. H. Knowlton.

ELECTRIC STEEL FOUNDERS' RESEARCH GROUP, Chicago—Exhibiting high-grade steel castings, small and medium sized. In attendance: R. A. Bull, C. N. Ring, A. C. Jones and David Zuege.

ELECTRO ALLOYS CO., Elyria, O.—Alloy castings such as used in furnace construction, heat treating equipment, heating machines, and oil burners will be displayed. H. P. Miller, A. M. Miller Jr., W. J. Hansen, J. W. Henry, A. L. Garford, J. B. Thomas and W. C. Whyte will be present at the booth.

ELECTRO REFRACTORIES CORP., Buffalo—Will exhibit silicon-carbide brick in various shapes, high temperature cement, and a new electrically fused nonspalling magnesite brick. In attendance will be L. U. Milward and C A. Asher.

ENDICOTT FORGING & MFG. CO. INC., Endicott, N. Y.—Drop forgings and drop forge products will be displayed. S. J. Marshall, G. B. Reed, T. B. Kelday and J. I. Smith will be in charge of the booth.

FALLS ELECTRIC FURNACE CORP., Buffalo—Will exhibit in operation an electric box-type furnace using full radiating sheet type units; equipment capable of long life, uniformity and rapid heating; sample unit sections and refractories. H. J. McCauley, J. R. Eves, C. M. Adams, H. E. Trent and J. V. Calhoun will be in charge of this company's booth.

FERNER, R. Y., CO., Washington—Exhibiting in operation high precision locating and jig boring machine; micro-indicators, tubes and supports for measurements of steel balls,

rings, blocks, and other metal parts; high precision bench micrometers, reading to 1/100000-inch. Attended by: R. Y. Ferner, Charles T. Ameel, Ernest Stucky, John Cetrule, Nicholas Cetrule and Peter Seibel.

FINKL, A., & SONS CO., Chicago—This exhibit will include hot work die steels, headers, grippers, etc., that have been in service; photos of plants and products. In attendanace will be C. E. Finkl, Fred Finkl, I. C. Vance, E. H. Graham, J. M. Curley, W. H. Rieger and T. P. Wallace.

FIRTH-STERLING STEEL CO., McKeesport, Pa.—Steels manufactured by this company will comprise its exhibit. Representatives will be L. Gerald Firth, D. G. Clark, Robert S. Stevick, G. J. Comstock, O. K. Parmiter, A. S. Martin, C. G. Thoma, A. E. Barker, O. T. Smith, H. I. Moore, E. T. Jackman, G. A. Jacobs, W. C. Royce, W. J. MacFarland, J. V. Little, R. F. Kimber, F. N. Mead, I. Olsen, Harry Jarvis, Fred Jarvis, G. R. Bunting, J. Johnson and W. A. Ruppel.

FORD, J. B., CO., Wyandotte, Mich.—Will exhibit samples of chemicals used in the cleaning of metals prior to finishing operations; also samples of work cleaned with metal cleaners made by this company. In attendance will be W. M. Cole, W. P. Scott, G. J. Lawrence and B. N. Goodell.

GAIRING TOOL CO., Detroit—An operating exhibit of multiplate operation standard and special cutting tools and tool holders; multiple operation tools, solid and inserted blade type; the new nose drive reamer; a new full floating holder which permits either angular or parallel float together with a tap holder for driving and holding taps, reamers, etc.; counterbore sets; offset spotfacing heads; chucking reamers; and grinding fixtures for sharpening various types of cutters. E. Gairing, Clayton E. Wyrick, B. O'Meara, D. J. Normoyle, E. T. Gropler, James Murray and William S. Harvey will represent this company.

GENERAL ALLOYS CO., Boston—A full line of heat treating containers, carburizing and annealing boxes, cyanide, lead and salt pots, tubes and retorts, dipping baskets, furnace parts, retorts, muffles, rails, hearths and other materials made of a new alloy developed by this company will be on display. Representatives will be H. H. Harris, W. K. Leach, George C. McCormick, Fred Blaney, W. R. Blair, R. A. Alger, J. C. Van Arman, R. M. Kirk, Ralph Hare, A. L. Grinnell, W. A. Toohill, A. D. Heath and H. G. Chase.

GOODELL-PRATT CO., Greenfield, Mass.—A complete line of portable electric drills of various sizes and also a display of machinists' and precision tools will be shown. F. W. Pratt, C. L. Jernberg and Lee Fluke will be in charge of the booth.

GOSS & DE LEEUW MACHINE CO., New Britain, Conn.—This is the initial exhibition of this company's new 6-inch multiple spindle chucking machine, threading type, motor drive; and 11-inch multiple spindle chucking machine, threading type, motor drive. In attendance will be Stanley T. Goss, Val. C. Hart, J. J. Spring, H. J. Hauck and E. H. Peck.

HAGAN, GEORGE J., CO., Pittsburgh—Will have on hand complete information covering line of oil, gas, electric and coal fired heat treating furnace equipment. Included in these data are lists of installations, photographs, drawings and operating data. R. E. Talley, C. F. Cone, J. L. Edwards, A. D. Dauch, J. Sandberg and V. A. Hain will represent the company.

HALCOMB STEEL CO., Syracuse, N. Y.—Showing types of products from various steels produced by this company. Exhibit attended by: F. B. Hufnagel, A. T. Galbraith, S. T. Harleman, H. A. Pardee, H. J. Stagg, S. C. Spalding, J. T. Leyden, H. Barlow and A. Fraser.

HAYNES STELLITE CO., Kokomo, Ind.—This company will exhibit oxyacetylene torches, oxygen and acetylene tanks and hose connections; and a display board demonstrating products such as tool bits, bar stock, welded tools, milling cutters anad other tools used for machining cast iron, malleable iron, semi-steel, brass, bronze, mild steel, etc. In attendance will be W. A. Wissler, A. V. Harris, G. E. Wilson and A. S. Shiffert.

HEPPENSTALL FORGE & KNIFE CO., Pittsburgh—This company will display a 24-inch and a 10-inch octagonal ingot, which has been split through the center. These ingots show the quality of steels made in the company's 18-ton acid open-hearth furnaces. A small model shear is shown in operation. This shear shows how the company's shear knives are used. In attendance will be C. W. Heppenstall, B. B. Weinberg, C. J. Sauer, A. J. Porter Jr., J. A. Succop, D. A. Stuart, G. I. Allen, F. C. Moyer, A. L. Wurster, L. A. Daines, C. G. Singleton, G. O. Desautels, and O. W. Mueller.

HEVI DUTY ELECTRIC CO., Milwaukee—The general line of electric heat treating furnaces made by this company will be shown. In attendance will be E. L. Smalley, F. A. Hansen and W. B. Cooley.

HISEY-WOLF MACHINE CO., Cincinnati—Drills, screw drivers, nut setters, tool post grinders, angle plate grinders, combination grinders and other electric tools will comprise this exhibit. H. W. Wallace, J. W. Friedlander and W. J. Holtmeier will have charge of the booth.

HOLCROFT & CO., Detroit—This company will show moving pictures of the latest installations of its equipment, and engineers at the

Welding Society Program and Technical Papers

FOR the second year, the American Welding society will conduct its fall meeting coincident with the annual convention of the American Society for Steel Treating. By this arrangement the Welding society takes advantage of the opportunity to hold its Welding and Cutting exposition as a part of the National Metal exposition. One whole section in Commercial Museum, comprising over 6000 square feet, has been set aside for the display and operation of welding and cutting apparatus, welding accessories and products fabricated by both the arc and gas welding processes.

Headquarters of the American Welding society will be at the Bellevue-Stratford hotel and there all of the technical sessions will be held. These have been scheduled for Tuesday morning and afternoon, Wednesday morning, Thursday afternoon and Friday morning and afternoon. Monday has been reserved for registration and committee meetings. Members of the welding society are invited to participate in the plant visitation trips arranged by the American Society for Steel Treating and described in detail on Page 764 of this issue. In addition, tentative arrangements have been made for visiting the welded building of the General Electric Co., the plant of the E. G. Budd Mfg. Co., and an airplane plant on Wednesday afternoon.

The American Welding society will join with the American Society for Steel Treating in the grand ball at the Benjamin Franklin hotel on Tuesday evening. The annual banquet and dance of the society will be held at the Bellevue-Stratford hotel on Thursday evening. Following is the detailed program for the five days' sessions:

Monday, Oct. 8

MORNING

10:00 a.m.—Registration at Bellevue-Stratford hotel.
12:00 noon—Registration at Commercial museum.

AFTERNOON

2:00 p.m.—Meeting of board of directors.

Tuesday, Oct. 9

MORNING

10:00 a.m.—Business session.
10:30 a.m.—Technical session.
"Welding in Heating, Ventilating and Plumbing Industry," by R. A. Jack, *Domestic Engineering*, Chicago.
"Testing Joints for Aircraft Structures Prepared under Procedure Specifications," by H. L. Whittemore, bureau of standards, Washington, and H. H. Moss, Linde Air Products Co., New York.

AFTERNOON

2:00 p.m.—Technical session.
"Welds at Elevated Temperatures," by Prof. C. Moser, Leland Stanford university, Palo Alto, Cal.
"Formula for Computing Design Stresses for Pressure Vessels," by S. W. Miller, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

EVENING

9:30 p.m.—Grand Ball at Benjamin Franklin hotel.

Wednesday, Oct. 10

MORNING

10:00 a.m.—Technical session.
"Running a Successful Job Welding Plant," by J. S. Oechsle, president, Metalweld Inc., Philadelphia.
"Welding in the Automobile Industry," by J. W. Meadowcroft, assistant works manager, Edward G. Budd Mfg. Co., Philadelphia.

AFTERNOON

2:00 p.m.—Plant inspection.

Thursday, Oct. 11

MORNING

10:00 a.m.—Meeting of the Joint Pressure Vessel committee

AFTERNOON

2:00 p.m.—Technical session.
"Design of Welded Structures," by F. P. McKibben, consulting engineer, General Electric Co., Schenectady, N. Y.
"Erecting a Building by Welding," by J. F. Lincoln, president, Lincoln Electric Co., Cleveland.
"Oxyacetylene Cutting in the Structural Field," by H. E. Rockefeller, Linde Air Products Co., New York.

EVENING

6:30 p.m.—Annual banquet and dance, Bellevue-Stratford hotel.

Friday, Oct. 12

MORNING

10:00 a.m.—Technical session.
"Studies of the Metal Arc," a special film presented by Dr. Karl Bung, German engineer.
"Design of Machinery Parts by Use of Welding of Steel Shapes," by Messrs. Hague, Marthens and Brinton, Westinghouse Electric & Mfg Co., East Pittsburgh, Pa.

AFTERNOON

2:00 p.m.—Meeting of the American Bureau of Welding.

EVENING

8:00 p.m.—Meeting of the Structural Steel Welding committee.

booth will answer questions pertaining to any equipment. H. L. Ritts, C. H. Martin, C. E. Barba, B. G. Tarkington and Oscar Brophy will be in charge of the exhibit.

HOSKINS MFG. CO., Detroit—This exhibit will include a new ribbon resistor electric furnace in operation and a display of resistance alloys and heat-resistant castings. In attendance will be C. S. Kinnison, F. L. Zimmerman, W. A. Gatward and W. D. Little.

HYDRAULIC TOOL WORKS, Philadelphia—A demonstration of portable hydraulic metal punches, punching 13/16-inch holes in the flange of I-beams and 1 1/16-inch holes in the web of H-columns will be included in this exhibit. Journal and thrust roller bearings also will be shown. In attendance will be Garrett F. Hom, and others.

IDEAL INDUSTRIAL MACHINERY, Cincinnati—Will exhibit a 36 x 60-inch star return tumbling barrel with power loader and motor drive; also photographs of a number of special installations. C. A. Albrecht, George Walsh and N. Ransohoff will represent this company.

ILLINOIS TOOL WORKS, Chicago—Hobs, milling cutters, reamers, broaches, screw machine form tools, special tools and shakeproof lock washers will be included in the display arranged by this company. In attendance will be P. J. Nelson, J. M. Gribbie, S. O. Bjornberg, W. L. Battersby and E. C. Crowther.

INTERNATIONAL NICKEL CO. INC., New York—An exhibit including: Typical applications of nickel and nickel alloys, including nickel steel, nickel cast iron and other important nickel-bearing ferrous and nonferrous alloys. In attendance: F. S. Jordan, R. A. Wheeler, E. J. Bothwell, A. J. Wadhams, P. D. Merica, T. H. Wickenden, Charles McKnight, D. M. Houston, J. S. Vanick, F. B. Coyle and J. W. Sands.

IRON TRADE REVIEW, Cleveland—This booth will be fitted pu as a restroom, which those attending the exposition are invited to make their headquarters. Copies of publications of the Penton Publishing Co. and technical books will be available. Representatives will be C. J. Stark, E. L. Shaner, J. D. Pease, G. O. Hays, F. F. Light, E. C. Kreutzberg, E. F. Ross, J. D. Knox, H. R. Simonds, B. K. Price and H. N. Pickett.

JESSOP STEEL CO., Washington, Pa.—Will have on display steel sheets, boards containing samples of cold-rolled strip steel, tool steel die exhibits, and stainless steel sheet exhibits. In attendance will be S. A. Grayson, F. T. H. Youngman, A. G. Lambert, R. M. Paxton Jr., F. T. Morgan and L. R. Samuels.

JONES & LAUGHLIN STEEL CORP., Pittsburgh—Hot-rolled and cold-finished steel and parts made therefrom; various shapes, cold-finished bars, light weight channels and beams; a new section of steel sheet piling, and other products of interest to those in attendance at this convention will be on display. Representing the company are W. B. Todd, J. D. Allen, J. S. Grumbling, H. W. Graham, J. H. Flaherty, W. R. K. Scott, T. C. Ham, William Miller, C. S. Bradley, A. A. Wagner, Leslie Edgecomb, H. L. Beyer, W. J. Franklin and H. N. Lutz.

KELLER MECHANICAL ENGINEERING CORP., Brooklyn, N. Y.—This company will exhibit its line of metalworking machinery including an automatic tool room machine for milling blanking dies and punches from thin metal templates and forming dies from cement masters and a cutter and radius grinder. P. C. Renno, Henry Schreiber, Harry Reichert and H. P. Loewenberg will represent the company.

KELLEY, J. W., CO., Cleveland—Carburizing compounds, industrial oils, heat treating salts and quenching and washing machines will feature this exhibit. J. W. Kelley and H. B. Northrup will be in charge at the booth.

KELLEY REAMER CO., Cleveland—Will exhibit a complete line of adjustable boring and reaming tools for industrial and railroad use, including single point tools, rigid type boring bars, block type boring and reaming tools, adjustable core drills, adjustable shell reamers and a complete exhibit of special production tooling. In attendance will be E. W. Putnam and Haviland Wright.

KEMP, C. M., MFG. CO., Baltimore—Various types of burners and furnaces operating from an automatic gas system, internally fired lead baths, open flame burners and a special display of gas burning under water comprise the exhibit of this company. Elmer B. Dunkak, W. M. Ponder and William Hunt will supervise this booth.

KEYSTONE LUBRICATING CO., Philadelphia—Will exhibit pneumatic safety lubricating system, showing its adaptability for automatic feed intermittently or continuously. Special greases for steel mill work and lubricants for ball and roller bearings also will be on display. In attendance will be H. A. Buzby, C. O. Norstrum, H. M. Ludwick, George W. Hall, T. B. Little, J. R. Lawrence, S. R. Marshall and F. D. Street.

K-G WELDING & CUTTING Co. INC., New York—Will exhibit a new oxygen and acetylene regulator, welding and cutting torch, and a number of other torches manufactured by this company. In attendance will be W. D. Flannery, P. Noren, William Munn, F. Leslie, H. Kress and Mr. Carr.

LAVA CRUCIBLE CO. OF PITTSBURGH, Pittsburgh—Will show a full line of the various types of refractories in standard brick, standard tile, special shapes, plastics, cements and graphite crucibles. Attended by: H. E. White, R. P. South and F. South Jr.

LEEDS & NORTHRUP CO., Philadelphia—This company will have a furnace exhibit showing hardening and tempering furnaces, and the latest hump-method hardening furnaces both for tools and for production work. The company's pyrometer exhibit will include the latest models of automatic controllers, indicating controllers, temperature indicators, and recorders. An interesting feature of the exhibit is the new indicating controller with a visible recorder and scale the entire width of the instrument. Optical pyrometers and portable indicators are on display. Representatives will be Henry Brewer, E. B. Estabrook, H. N. Michael, Earl Wood, Carl Parker, G. W. Talk Jr., A. E. Tarr, W. A. Lane and W. C. Roxby.

LINCOLN ELECTRIC CO., Cleveland—Complete electric arc welding equipment together with a display of various castings replaced by welded steel; also a welded motor together with a motor operating under water will comprise the exhibit of this company. E. E. Lewis, O. P. Lang, J. W. Kenworthy, E. J. Pfister, D. C. Anderson and A. F. Davis will represent the company.

MAHR MFG. CO., Minneapolis—Will exhibit, in operation, complete model of rotary

Nonferrous Papers Scheduled

by Institute of Metals

ONE of the three organizations contributing to make National Metal Week in Philadelphia a success is the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, which will hold its meeting at the Benjamin Franklin hotel. Last year also the institute convened simultaneously with the American Society for Steel Treating. These organizations have certain interests in common and coincident meetings make it possible for members to participate in the sessions proving of most interest. Three technical sessions are to be held, the first on Tuesday morning, the second on Wednesday afternoon and the third on Thursday morning. The balance of the time has been left open for visits to the National Metal exposition and for the plant inspection trips arranged by the American Society for Steel Treating and described in detail on Page 764 of this issue. Members of the institute will join with the Steel Treaters in the grand ball at the Benjamin Franklin hotel on Tuesday evening. The institute dinner will be served at the same hotel on Wednesday evening. Following is the complete program of events:

Tuesday, Oct. 9

MORNING

9:00 a.m.—Registration.

10:00 a.m.—Technical session.

"Less Common Elements in the Electrical Industry," by T. S. Fuller, research laboratory General Electric Co., Schenectady, N. Y.

"Gases in Casting Copper," by O. W. Ellis, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Diffusion of Zinc into Copper," by S. L. Hoyt, research laboratory, General Electric Co., Schenectady, N. Y.

"Constitution of the Copper Silicon System," by C. S. Smith, president, Old Dominion Co., Boston, Mass.

AFTERNOON

2:00 p.m.—Plant inspection.

Wednesday, Oct. 10

MORNING

9:30 a.m.—Plant inspection.

AFTERNOON

2:30 p.m.—Joint session with American Society for Steel Treating.

"Notes on Smoothing and Etching," by H. B. Pulsifer, Ferry Cap & Set Screw Co., Cleveland.

"Further Oservations on the Microstructure of Martensite," by F. F. Lucas, Bell Telephone Laboratories, New York.

"Treatment and Structure of Magnesium Alloys," by J. A. Gann, Dow Chemical Co., Midland, Mich.

"Neumann Bands in Ferrite," by C. H. Mathewson, professor of metallurgy, Yale university, New Haven, Conn.

"A Study of the Constitution of High Manganese Steels," by V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh.

EVENING

6:30 p.m.—Annual dinner, Benjamin Franklin hotel.

"Chromium Alloys," by Dr. F. M. Becket, vice president, Union Carbide & Carbon Corp., New York.

Thursday, Oct. 11

MORNING

10:00 a.m.—Technical session.

"Effect of Cold Rolling and Heat Treatment Upon the Physical Properties of Britannia Metal," by B. Egeberg, International Silver Co., Meriden, Conn., and H. B. Smith, Seattle, Wash.

"Stability of Aluminum and Magnesium Casting Alloys," by A. J. Lyon, Wright field, Dayton, O.

"Equilibrium Relations in Aluminum, Magnesium and Aluminum-Magnesium-Silicide Alloys of High Purity," by F. Keller and E. H. Dix Jr., Aluminum Co. of America, New Kensington, Pa.

"Permanent Mold Aluminum Alloy Pistons."

"High Strength Gold Alloys," by E. M. Wise, International Nickel Co., Bayonne, N. J.

AFTERNOON

2:00 p.m.—Plant inspection.

Friday, Oct. 12

MORNING

9:30 a.m.—Plant inspection.

AFTERNOON

2:00 p.m.—Plant inspection.

forging furnace equipped with gas burners; blower; and complete line of oil burners. In attendance: W. G. Barstow, C. F. Olmstead, R. M. Hortvet, D. H. Ruhnke, A. J. Nordenson, Ray W. White, G. A. Ledebur, A. E. Stansel, Arthur Tenney, C. W. Rudolph, B. G. Harmon and B. M. Brownell.

McCANN HARRISON CORP., Cleveland—Model in operation of a continuous conveyor beam furnace will be displayed at this exhibit. In attendance will be H. B. McCann, Edward Busch and C. L. Stewart.

McGILL METAL CO., Valparaiso, Ind.—Will exhibit, in operation, a variety of types and sizes of ball bearings, together with several machine parts showing actual application of ball bearings; also a machine for testing ball bearings under service conditions. In attendance will be Frank R. Schubert, W. E. Brownell, T. L. Robinson and William Scrimgeour.

METAL & THERMIT CORP., New York—Exhibiting specimens of welds, equipment for welding, etc.; alloys. J. H. Deppeler, Arthur F. Braid, H. D. Kelley and R. L. Browne will be in attendanace.

MICHIGAN STEEL CASTING CO., Detroit—This exhibit will include high temperature alloy castings, such as carburizing boxes and tubes, cyanide pots, dipping baskets, rotary furnace retorts, furnace parts, such as rails and plates, and several types of pusher furnace trays and fixtures.—F. J. Stanley, E. D. Flintermann, J. D. Corfield, W. E. Broadbelt and J. C. Redmond will be in charge.

MICHIGAN TOOL CO., Detroit—Will exhibit a line of hobs, shaper cutters, thread cutting tools, milling cutters, side mills, special form tools, special cutters, inserted blade cutters, etc. In attendance will be J. W. Mull Jr., T. A. Oleck, C. M. Conner, E. O. Jenkins, T. A. Meyer and Charles Peterson.

MILNE, A., & CO., AND EDGAR ALLEN STEEL CO. INC., New York—Exhibiting tool steels, die steels, hollow die steels; hollow drill steel, auger drill steel, special sections; Lancashire iron and electrical iron; ball bearing steel and ball wire; cutlery sheets, gig saw sheets, hack saw sheets, and file sections; anvils; hammers; high-speed steel; turning and finishing steels; air hardening steel, self-hardening steel and special chisel steel; tack knife steel; die casting steel; production steel; hollow production steel; tool steel. Attended by: Henry Sears Hoyt, J. King Hoyt Jr., V. A. Greene, R. P. Rice, G. K. Boland, A. E. Van Stone, E. R. Carnell, H. R. Adams, Miss K. E. McDonald and B. Brower.

MILWAUKEE DIE CASTING CO., Milwaukee—Will exhibit various types of die castings, in the following alloys: aluminum, zinc, lead, and tin; also samples which have been polished and plated to disclose the ease with which this work may be accomplished; various assemblies to demonstrate the application of die castings in connection with the metalworking industries. H. F. Schroeder and C. H. Frantz will have charge of this booth.

MOLYBDENUM CORP. OF AMERICA, Pittsburgh—Will exhibit various types of nitrided steels, together with hardness testing machines to illustrate the hardness of these steels; also examples of malleable and gray iron castings containing molybdenum. In attendance will be G. M. Eaton, William H. Phillips, E. J. Lowry and Clifton Taylor.

MORSE TWIST DRILL & MACHINE CO., New Bedford, Mass.—A full line of high speed and carbon drills and reamers, taps, dies, screw plate sets, and milling cutters will be shown by this company. In attendance will be F. O. Lincoln and George M. Read.

MUELLER BRASS CO., Port Huron, Mich.—Will exhibit, in operation: Brass and copper tubing; brass and bronze nickel-silver rod; brass, bronze and copper nickel-silver forgings; brass, bronze and nickel-silver screw machine parts; brass and bronze sandcastings; welding rod, brass pipe and fittings. Attended by: W. W. Roach and B. F. Mueller.

NATIONAL TWIST DRILL & TOOL CO., Detroit—Will exhibit a complete line of twist drills, milling cutters, reamers and hobs. An added feature is the smallest twist drill in the world. Of special interest to users of twist drills is an exhibit of drills with various types of points. The resultant damage to drills, as well as poor, inaccurate holes obtained when such drills are used, also are shown. In attendance will be Harry Butler, George Ringstad, J. J. Jordan, E. W. Haines and C. C. Cornwall.

OLSON, TINIUS, TESTING MACHINE CO., Philadelphia—Will exhibit, in operation, for the first time in the United States the Herbert-type hardness testing machine and equipment for superhardening steel; also for the first time, the Johnson hardness tester for applying brinell hardness test. Other types of hardness testing machines also will be on display. Among the testing machines will be the universal testing machine for tension, compression and transverse testing, the direct motor-driven production type brinell hardness tester as well as hand-operated type of machine; also the latest type of direct motor driven ductility testing machine for sheet metal testing and other testing equipment. In attendance will be Thorsten L. Olsen, Robert B. Lewis, Jacob Lundgren and Bruce L. Lewis.

PENTON PUBLISHING CO., Cleveland—Will show technical and commercial books and periodicals dealing with heat treating, forging and other phases of the metalworking industry. Restroom for those desiring to confer in quiet. Copies of IRON TRADE REVIEW, *Daily Metal Trade* and *The Foundry* and other Penton publications will be available. Represented by C. J. Stark, E. L. Shaner, J. D. Pease, G. O. Hays, F. F. Light, E. C. Kreutzberg, E. F. Ross, J. D. Knox, H. R. Simonds, B. K. Price, and H. N. Pickett.

PITTSBURGH INSTRUMENT & MACHINE CO., Pittsburgh—A hand-operated brinell testing machine, power-operated brinell testing machine, perfection brinell machine (new type), brinell microscope, brinell microscope with illuminator attached, metal sheet tester, and a metallographic grinding machine comprise the exhibit of this manufacturer. Paul Kammerer and Walter Kammerer will be in charge of the booth.

PORTER-CABLE MACHINE CO., Syracuse, N. Y.—Will exhibit a high-speed production lathe; heavy-duty universal milling attachment; horizontal disk sander; two-belt sander and grinder; sand sanders with bench stands; portable electric hand saw. The lathes are turning and facing bronze bushings. In attendance: K. O. Ditmars, and D. J. Ridings.

POTTS, HORACE T., & CO., Philadelphia—Exhibit will include: Tools and dies made of tool steel; oil hardening and super strength steel; machine parts made of heavy-duty constructional and machinery steels; alloy steel, heat treated; machinery steel. Represented by: Arthur L. Collins, Henry R. Wimmersberger, Maurice H. Felty, L. D. Willis, A. W. Ainsworth, Guy P. Bible, Thomas C. Potts, Charles W. Potts, J. J. Drexler, Claude Mengel, Stanley L. Bateman, and W. H. Dunlap.

PRODUCTION MACHINE CO., Greenfield, Mass.—Will exhibit in operation polishing and finishing machinery and centerless polishing and finishing machines. In attendance: W. S. Howe, A. H. Behnke and Leon Kinsman.

PYROMETER INSTRUMENT CO., New York—Exhibit will present in operation: radiation, optical, immersion, surface pyrometers. In attendance: Richard C. Jordan, F. D. Heidorn and O. Raab.

REINTJES, GEO. P., CO., Kansas City, Mo.—Will exhibit display of flat arch brick for

Officers of Institute of Metals

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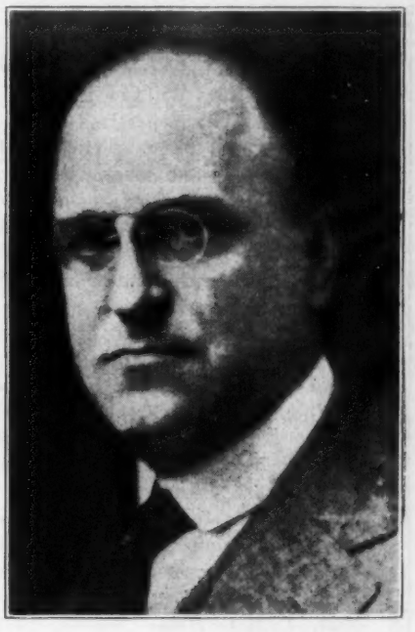


S. SKOWRONSKI
Chairman

use in high temperature furnaces especially where large cross section of the gas duct is required and where head work is limited; truss arch shapes. In charge of: George P. Reintjes, S. Skouse and John Hawkins.

ROCKWELL, STANLEY P., CO., Hartford, Conn.—In this exhibit will be shown in operation: Laboratory and remote control dilatometer on model furnace; an exhibit relating to metallurgical consulting service; also dilatometer equipment in booths of the E. F. Houghton & Co., and Peoples Gas Light & Coke Co. Stanley P. Rockwell, Warren D. Fuller, Raymond W. Woodward, William A. Stumpf and Kenneth Stumpf will be in attendance.

ROESSLER & HASSLACHER CHEMICAL CO., New York—Will exhibit in operation: Plating deposits of zinc and copper; electric pot furnace demonstrating cyanide case hardening; display of sodium cyanide, cyanide mixtures and all salts used in the heat treating trade; copper cyanide, zinc cyanide, and all accessory chemicals used in the electroplating industry; and specimens of case hardened and electroplated work. Booth attended by: Walter M. Gager, Charles H. Proctor and William J. Schneider.

ROTOR AIR TOOL CO., Cleveland—The exhibit will include in operation: Portable pneumatic grinders and drills and air sander for use with sanding disks and for use with cup wheels for flat finish surfacing. In attendance: K. L. Pohlman, L. K. Berry, F. R. Moore and G. O. Singer.

SCHERR, GEORGE, CO. INC., New York—

Variety of Plant Visitations Offered

PHILADELPHIA'S industrial activity dates back to the Colonial days, consequently located in this city are numerous establishments which can boast of existences of 100 years or more. Through diversity of products and number of manufacturers, the city ranks high. Numerous plants have opened their doors to visitors during National Metal Week. In addition to the following visits scheduled by the American Society for Steel Treating, the American Welding Society has tentatively arranged for Wednesday afternoon visits to the welded building of the General Electric Co., E. G. Budd Mfg Co., and an airplane factory. In all cases visitors will provide their own transportation and will meet at the plants at the hours designated. The plants and what may be seen are as follows:

Tuesday, Oct. 9

Midvale Co., Nicetown. (9:30 a. m.)—Visitors will see the making of steel wheel tires, weldless rings and flanges; rings and cut gears; car and tractor wheels; forgings of all sizes, especially heavy forgings; open-hearth and electric steel billets, ingots and castings, ordnance and army and navy gun forgings.

Riehle Bros. Testing Machine Co., 1424 North Ninth street. (9:30 a. m.) Visitors will see the home of the Riehle physical testing machines for physical testing of all types, kinds and sizes of materials.

Curtis Publishing Co., Independence Square. (9:30 a. m.) Visitors will see the printing plant of the *Saturday Evening Post, Ladies' Home Journal* and the *Country Gentleman.*

Wednesday, Oct. 10

Leeds & Northrup Co., 4901 Stenton avenue. (10:15 a. m.) Visitors will see a modern instrument making plant, operated on a production basis and making hump-type hardening and heat treating furnaces; potentiometer pyrometers; a wide range of precision electrical measuring instruments; and metered combustion control equipment.

Temple university, Corner Broad street and Montgomery avenue. (9:30 a. m.) Visitors will be shown Temple university buildings and equipment.

Westinghouse Electric & Mfg. Co., South Philadelphia works at Lester. (9:30 a. m.) Visitors will see the manufacture of prime mover equipment, including steam turbines ranging in capacity from ½ to 160,000 kilowatts; all types of pumps, air ejectors, heat exchangers, reduction gears; and gasoline and diesel engines for rail car application.

Thursday, Oct. 11

Victor Talking Machine Co., Front and Cooper streets, Camden, N. J. (10:30 a. m.) Visitors will see the home of the Victor talking machines and the orthophonic.

Autocar Co., Lancaster avenue, Ardmore. (9:30 a. m.) Visitors will see the home of Autocar motor trucks and coaches.

Brown Instrument Co., Wayne and Roberts avenues. (9:30 a. m.) Visitors will see modern instrument making plant, producing pyrometers, recording and indicating instruments, automatic controls for furnaces; steam flow meters and carbon dioxide recorders; cupola control equipment; and pyrometers for controlling pouring temperatures of nonferrous metals.

Friday, Oct. 12

Tinius Olsen Testing Machine Co., 500 North Twelfth street. (9:30 a. m.) Visitors will see the plant making testing machines for physical testing and balancing. A display of special testing machines will be shown.

United States Navy Yard, League Island. (9:30 a. m.) Visitors will see large naval foundry and machine shops; about 150 decommissioned men-of-war, including destroyers and submarines; the battleship OKLAHOMA being modernized; and the naval aircraft factory with its engineering laboratory. An airplane will be catapulted into the air for the visitors.

No Assigned Dates

William Sellers & Co. Inc., 1600 Hamilton avenue. Visitors will see the making of machine tools, grinders, drill grinders and injectors. Groups of not to exceed six can make arrangements by telephoning Mr. Harper or Mr. Phillips.

Bethlehem Steel Co., Bethlehem, Pa. Visitors will see a large steel plant which includes open-hearth and bessemer departments, coke plant, rolling mills, forging departments, foundries, heat treating and fabricating departments, machine shops, tool steel department, truck wheel plant, and physical and chemical laboratories. Arrangements for trip to be made by calling at booths 111-114 at exposition.

Ajax Electrothermic Corp., Trenton, N. J. Visitors will see the making of electric furnaces. A 200-300 pound steelmaking furnace will be operating from a 150-kilowatt high-frequency generator; also a 500-pound steel melting furnace; a 35-kilovolt-ampere converter and several furnaces operating from it. Arrangements for trip to be made by calling at booth 32 at exposition.

Carpenter Steel Co., Reading, Pa. Visitors will see the works and departments making special alloy and tool steels. This includes electric furnace melting, rolling to finished bars, forging, cold-rolled strip steel and cold-drawn wire. Arrangements for trip to be made by calling at booth 171 at exposition.

Will show a gear hobber, special worm miller, small automatic hobber and automatic hob grinder; optical measuring tools. In attendance: George Scherr, F. Konig, George Van de Plank and George Kaner.

SENTRY CO., Taunton, Mass.—Showing, in operation its furnaces in several models. In attendance: A. A. Harvey and P. B. Crocker.

SHORE INSTRUMENT & MFG. CO., Jamaica, N. Y.—An operating exhibit of scleroscope, dial type; bulb type hardness tester for steels and materials; optical pyrometers; rubber testing instruments for hardness and elasticity of plastic materials; local case and local hard compounds used in the heat treatment of steels for selective hardness; and a static test for hardness of steels and materials. F. G. Kendall and J. M. Kendall will be in attendance.

SIMONDS SAW & STEEL CO., Fitchburg, Mass., and Lockport, N. Y.—Will exhibit saws for cutting wood and metal, machine knives, files, hack saw blades, special tool steels, high speed steel, magnet and nickel steel and bullet-proof steel plates. Representatives present will include C. R. Pafenbach and H. B. McDonald.

SLEEPER & HARTLEY, INC., Worcester, Mass.—Will show in operation spring coiling machine, one of a series of 11 sizes, adapted to take wire from 0.004-inch diameter up to ⅝-inch diameter and to produce springs of varying and complicated kinds at high speed. Exhibit will be in charge of P. Mignacca.

SMITH, DAVID H., & SONS, INC., Brooklyn, N. Y.—An operating exhibit of combination punching and shearing machines; billet shears, built of steel plate frame construction with labor saving attachments. In attendance: William H. Krapohl and Dudley J. Smith.

SOUTHERN MANGANESE STEEL CO., St. Louis—Exhibit will include: Assortment of heat and corrosion-resistant alloys in the chrome, nickel series. In attendance will be: E. F. Mitchell, W. M. Black, J. T. Norris, D. M. Powers, F. A. Fahrenwald and A. W. Daniels.

SOUTHWARK FOUNDRY & MACHINE CO., Philadelphia—An operating exhibit of: 60,000-pound testing machine; electric telemeter; strain gage; and tensometer. In attendance will be H. A. Weaver and Francis G. Tatnall.

SPENCER TURBINE CO., Hartford, Conn.—Will show in operation turbocompressors for supplying air in connection with oil and gas burning industrial furnaces, foundry cupolas, etc. One compressor will supply the air for the furnaces in operation at the exposition. Representatives will be S. E. Phillips, F. A. Wright, F. D. Bailey and O. J. Dingee.

STANDARD ALLOY CO. INC., Cleveland—Will exhibit carburizing boxes, lead pots, normalizing and pack heating furnace disks and spacers, enameling burning racks, heat resisting conveyor chain grates, furnace trays and shoes, chimney pots, furnace parts and miscellaneous heat and acid resisting castings covering in general the heat treating and chemical field. In attendance will be: Frank F. Jackson, Harvey M. Smith, Emerson M. Williams, J. H. Williams, Charles D. Cutting and Herbert A. Cutting.

STANDARD TOOL CO., Cleveland—Exhibiting twist drills, reamers, taps, milling cutters, drill chucks. W. P. Ross, H. H. Polk, D. M. Dorsheimer Jr., F. T. McGuire and C. C. Buck will be in attendance.

STARRETT, L. S., CO., Athol, Mass.—Will exhibit mechanical tools, such as micrometers, gages, indicators rules, levels, calipers, dividers, hack saw frames and steel tapes, featuring high-speed and tungsten steel hack saw blades. In attendance: D. Moffatt, A. H. Starrett, D. Findlay and H. E. Masters.

STEEL CITY TESTING LABORATORY, Detroit—An operating exhibit, showing: Brinell testing machine; hardness testing hammer; sheet metal tester; three styles of brinell microscopes; and adapter for scleroscope. In charge of H. A. Weaver.

SURFACE COMBUSTION CO., Toledo, O.—Exhibit will include, in operation: Heat treating furnace with two stage burners and automatic temperature control for temperature range of 1200 to 2000 degrees Fahr.; small oven furnace for high-speed steel treating; standard forge furnace. Not operating: Small oven heat treating furnace; circular cyanide hardening furnace; aluminum melting furnace; crucible brass melting furnace; high and low-pressure inspirators; several types of burners; pictorial display of recent installations of furnaces for forging, hardening, drawing, annealing, normalizing, reheating, enameling, etc. In attendance: F. W. Manker, C. B. Phillips, C. A. Blesch, W. T. Fulton, Philip Kriegel, F. C. Starr, F. H. Trembley, K. H. Cree and E. A. Weaver.

SWIND MACHINERY CO., Philadelphia—Will show, in operation: A machine designed to meet the exacting requirements of tool room operations in fixture and jig work, and production work. Exhibit attended by L. H. Swind, W. J. Powers, G. Helling, G. A. Marshall and W. C. Chapman.

THWING INSTRUMENT CO., Philadelphia—Showing operating exhibit of: Standard thermoelectric pyrometers including both base metal and platinum thermocouple, inspector's calibrating and checking sets and millivoltmeters; recording pyrometer; resistance thermometers. Charles B. Thwing, Edward J. Albert, A. S. Hall, L. R. Driscoll and P. P. Bourquin, will be in attendance.

TRENT, HAROLD E., CO., Philadelphia—Will exhibit, in operation: Electric pot and trough-type heat treating furnaces for lead, salt or cyanide; direct heat electric furnaces for steel treating; melting pots for babbitt, solder, tin, etc.; and other electrically heated industrial equipment. Shown by: H. E. Trent, J. V. Calhoun, C. M. Adams and J. R. Eves.

TUTHILL PUMP CO., Chicago—An operating exhibit of rotary pumps, from ½ to 200 gallons per minute for use in heat treating departments or for general plant use in handling of oils for all uses, supplying coolant on machine tools, packless pump, capable of withstanding high pressures. Attended by O. L. Bock and H. C. Osborne.

UNA WELDING & BONDING CO., Cleveland—Exhibiting: Welders, both alternating and direct-current; automatic welding head; welding rods. In attendance: Edward R. Alexander, E. W. Kronbach, A. A. Probeck, L. S. Burgett and J. B. Austin.

UNION MANUFACTURING CO., New Britain, Conn.—Exhibit will include: Chucks for the lathes, boring mills, planers, drills, brass workers; face plate jaws and special chucks; hoists as follows: spur geared, acme differential hoists, and trolleys. Booth will be in charge of: E. I. Stevens, J. V. Murphy and H. H. Wheeler.

UNIVERSAL STEEL CO., Bridgeville, Pa.—Exhibiting sheets of carbon and alloy steels; bars of carbon, alloy and high-speed tool steels, ball race, magnet, file and valve steels; sheet and bars of heat resisting and noncorrosive steels and alloys, cold-drawn bars and cold-rolled sheets, hot heading dies; and finished products. Attended by: J. O. Rinek, U. G. Miller, Frank Garratt, H. M. German, Frank Saltsman, H. G. Coop, Charles Evans, F. F. Harter and F. H. Cooke.

VANADIUM-ALLOYS STEEL CO., Latrobe, Pa.—Will show carbon, alloy and high-speed tool steels; typical tools made of tool and high-speed steels; fractures showing effects of treatments; cold-drawn tool and high-speed steels; tools and dies which have given unusual production records. In attendance: R. C. McKenna, Floyd Rose, L. D. Bowman, J. P. Gill, R. B. George, W. M. Caruthers, W. R. Mau, D. L. Bardes and F. W. Potts.

VANADIUM CORP. OF AMERICA, New York—Exhibit of ferrovanadium; silicovanadium; aluminovanadium; vanadium metal, 95 per cent; ferrochrome; ferrosilicon; vanadium steel railroad springs, valve springs, carbon vanadium automobile crankshafts, forgings, etc. Exhibit will be attended by: Ward A. Miller, B. D. Saklatwalla, J. A. Miller Jr., H. T. Chandler, N. Petinot, G. L. Norris, Jerome Strauss, C. N. Dawe, C. B. Woodworth and G. A. Laub.

VAN DORN ELECTRIC TOOL CO., Cleveland—An operating exhibit showing working models of portable tools, electric drills, screw drivers, wrenches and grinders; tools suitable for operation on high frequency current; tapping tool; and various sizes of electric reamers. Represented by: F. H. Zulauf, Lyman H. Bellows, S. S. Waters and Louis Charnicky.

VULCAN CRUCIBLE STEEL CO., Aliquippa, Pa.—Will exhibit high-speed, alloy and carbon tool steels; special steels. In attendance: S. G. Stafford, R. M. Kelso, A. D. Beeken Jr., S. A. Stafford, W. H. Norris, C. E. Conway, Norman C. Einwechter and W. F. Kline.

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa.—The arc welding exhibit shows welding equipment, including 200, 300 and 400-ampere arc welding sets. An electric furnace for lead or salt baths with a section cut away to show the interior structure; a match vending novelty operated by a grid glow tube; and installations of Westinghouse furnaces, with operating and production data. In attendance: W. W. Reddie, A. M. Candy, N. M. Norberg, T. C. Kelley, J. C. Woodson, F. G. Allen, C. W. Babcock, J. F. Baker, H. C. Bostwick and L. C. Schweitzer.

WHEELING MOLD & FOUNDRY CO., Wheeling, W. Va.—Will show: Section of chilled iron sheet mill roll, section of alloy steel heat treated roll; alloy steel heat treated forging die, and alloy steel hammer ram. In charge of H. E. Field, E. A. Baisley, R. C. Heaslett and Craig Adair.

WHEELOCK, LOVEJOY & CO. INC., Cambridge, Mass.—Exhibiting alloy machinery steels; tool steels in application to special parts; replica of open-hearth furnace in operation. Attended by: A. Oram Fulton, F. H. Lovejoy, E. C. Bartlett, S. W. Parker, C. F. Jenks, A. L. Knight, A. F. Erikson, H. B. Briggs, H. M. Foster, G. S. Longley and T. W. Knight.

WHITNEY METAL TOOL CO., Rockford, Ill.—Will exhibit: Hand metalworking punches, shears, and angle iron machinery. Attended by: John Jensen and Gus. Jensen.

WIEDEMANN MACHINE CO., Philadelphia—Photographs of plant and various operations will be shown by Theodore Wiedemann, Henry Bockrath, J. H. Bockrath and Otto F. Wiedemann.

WIEGAND, EDWIN L., CO., Pittsburgh—Exhibiting its line of strip heaters; space heaters; immersion units; complete electric heaters; automatic electric water heaters; etc. Will be attended by: Ernest N. Calhoun, C. M. Adams, H. E. Trent and J. V. Calhoun.

WILLIAMS, J. H., & CO., Buffalo—Will show an exhibit of drop-forgings, for automobiles, airplanes, etc.; drop-forged wrenches from chromium-molybdenum and plain carbon steel; monkey wrenches, bull dog wrenches, drop forged clamps, crank handles, eye bolts and hoists hooks. Representatives in attendance: J. C. Scanlon, Philip Rigby and Walter Linde.

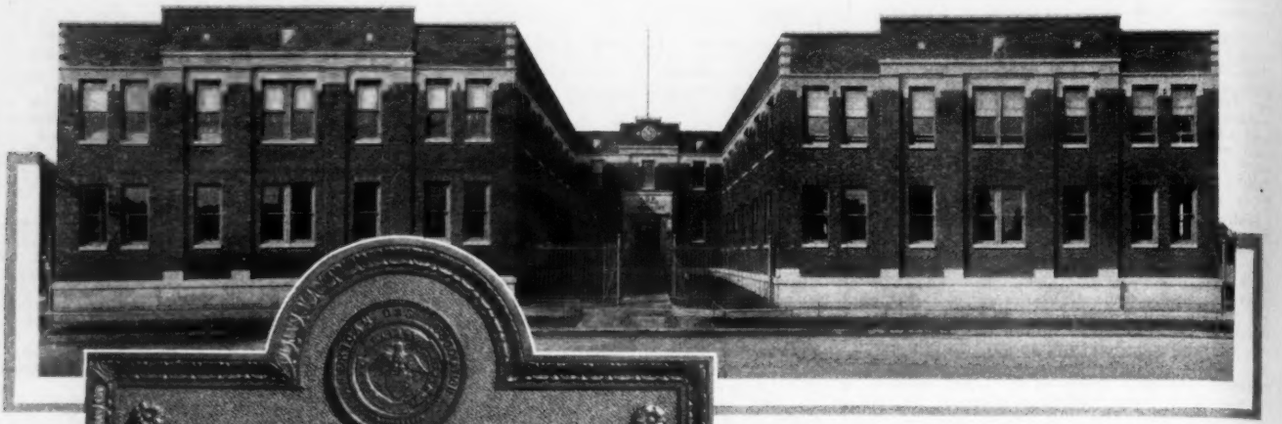
WILSON-MAEULEN CO. INC., New York—Exhibiting: Automatic temperature controllers; recording pyrometers; indicating pyrometers; hardness testers, indicating resistance thermometers and recording resistance thermometers. In attendance: G. B. Duff and W. Printz.

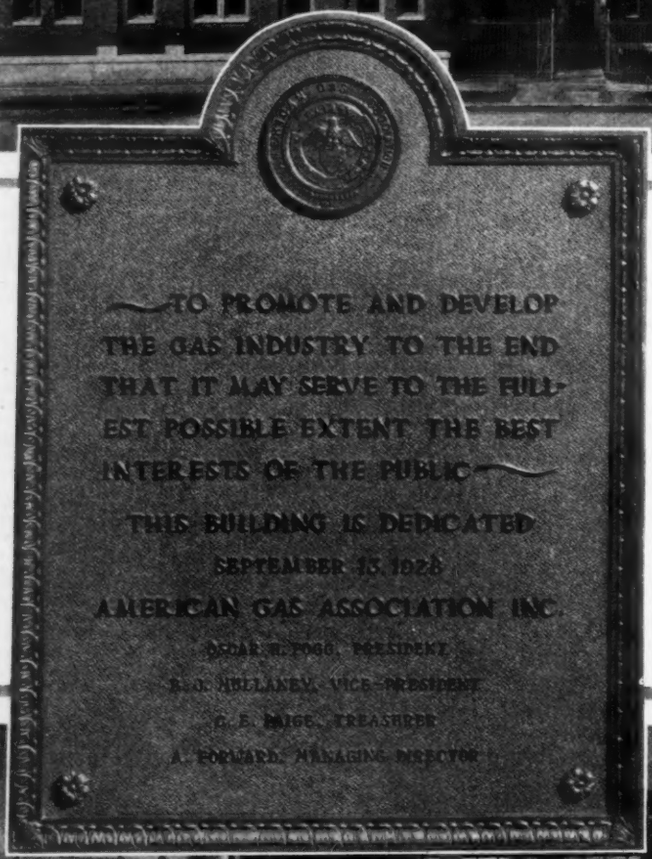
WILSON WELDER & METALS CO., Hoboken, N. J.—Exhibiting: Welding machine, motor-generator type, and gasoline engine driven type; welding wire and welding accessories. Attended by: T. B. Hasler, E. D. Bransome, Alexander Churchward, L. A. Quarmby and Harry Schemm.

Convention Daily Will Appear Fourth Time

FOR the fourth consecutive year, the Penton Publishing Co. will issue a special STEEL TREATERS' DAILY *during National Metal Week. This daily newspaper which is sponsored by* IRON TRADE REVIEW *and* DAILY METAL TRADE, *will appear in Philadelphia on Tuesday, Wednesday, Thursday and Friday mornings. Each issue will contain complete programs and reports of convention sessions, descriptions of the exposition, biographical sketches of prominent members of the American Society for Steel Treating, American Welding society and Institute of Metals. A wealth of news of general interest also will be presented. Complimentary distribution of copies of* STEEL TREATERS' DAILY *will be made at Commercial Museum, Benjamin Franklin hotel and Bellevue-Stratford hotel. In addition, arrangements have been made to mail copies for all four days to all members of the American Society for Steel Treating, thus carrying to those absent all the news of the convention while it is still news. Extra copies may be obtained at the headquarters of* IRON TRADE REVIEW *and* DAILY METAL TRADE *at Booth 79.*

Gas Association Opens National Laboratory

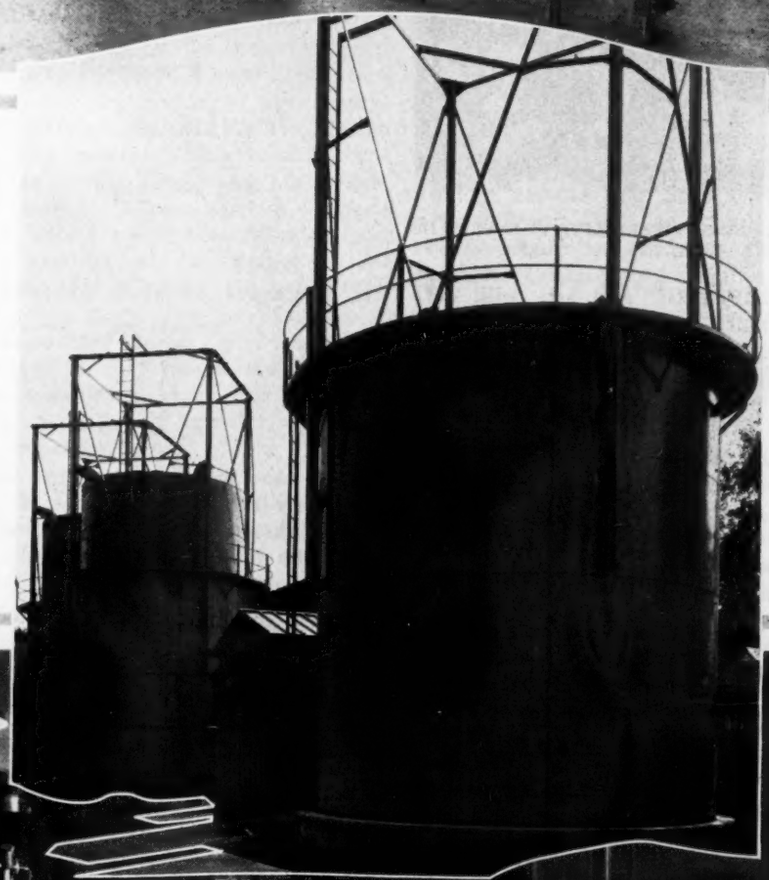


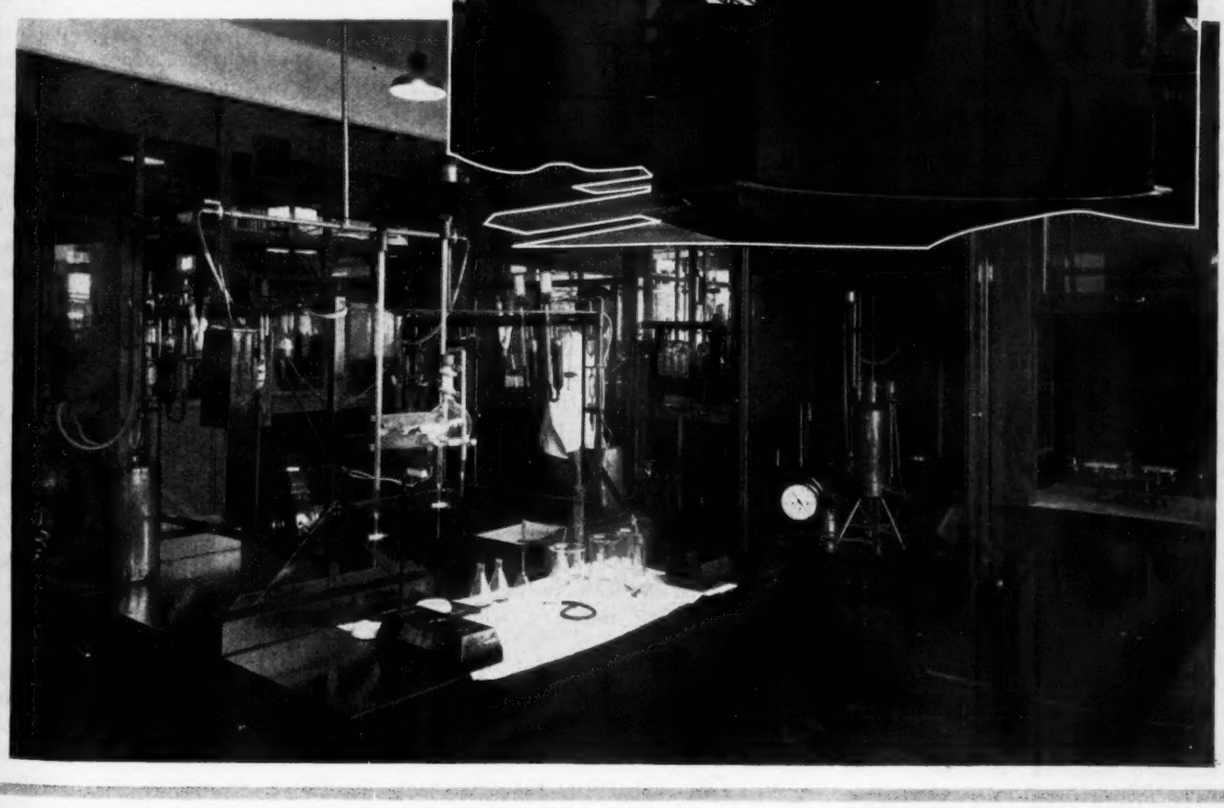

TO PROMOTE AND DEVELOP
THE GAS INDUSTRY TO THE END
THAT IT MAY SERVE TO THE FULL-
EST POSSIBLE EXTENT THE BEST
INTERESTS OF THE PUBLIC
THIS BUILDING IS DEDICATED
SEPTEMBER 13 1928
AMERICAN GAS ASSOCIATION INC.

OPENING ceremonies for the new national testing laboratory of the American Gas association, 1032 East Sixty-second street, Cleveland, were held Sept. 13, and included unveiling of the tablet illustrated herewith, an informal luncheon in the building and speeches by officials of the association and member companies. The building is a two-story brick structure and provides approximately 3200 square feet of office space, 8700 square feet of storage space and 14,700 square feet for appliance testing and research. Coke oven gas, water gas and mixed gas are available in storage tanks for use in testing various types of gas equipment. Natural gas is taken from city mains.

Structure Houses Finest Testing Equipment

VIEWS of the new laboratory are shown in the accompanying illustrations. A front view of the building, the dedicatory tablet which was unveiled at the opening ceremonies and a glimpse of the informal luncheon served in the building are shown on the preceding page. The mixed gas research department is shown above. To the right are the three 1000-cubic-foot gas reservoirs for storing the various kinds of gas used; below is the chemical laboratory showing iodine pentoxide apparatus, gas analysis equipment and calorimeter.





Pickling Influences the Spangle of Zinc-Coated Sheets

FIG. 1—BRIGHT FERN-LIKE SPANGLES ON A GALVANIZED SHEET

Certain Qualities in Base Metal Essential for the Development of Suitable Finishes

By Wallace G. Imhoff

FIG. 2—MEDIUM SIZED SPANGLES ON A GALVANIZED SHEET

SULPHURIC acid acts with difficulty on steel when grease is present. If the surface of a sheet to be galvanized is not cleaned and pickled properly, the development of the spangle is hindered, in fact the surface will not take a zinc coating. The pickler's field of operation is limited by the chemical composition and quality of the steel base. If the steel has been pickled properly, the causes of small spangles and a poor galvanized coating are to be sought in the steelmaking process, in the soaking pit practice, and in the sheet and pair furnaces.

The sheet bars must be heated uniformly, and, while it is desirable to have them as hot as practical for rolling, care must be taken, especially in the case of pickled bars, to see that they are not heated beyond a certain temperature, else a scale will be raised and it will be difficult to secure the smooth surface which is desired.

Definite Temperature Limit

The maximum temperature for common bars is about 1560 degrees Fahr., while the upper limit for pickled bars is somewhat lower.

Wrought iron whether good or bad quality, galvanizes with small, granular, rough crystals; a good grade of steel usually galvanizes with a large fern-like spangle, and poor steel gives a medium, or a small spangle. The difference in the chemical composition of wrought iron and steel for galvanized sheets is as follows:

Element	Wrought iron, per cent	Sheet bar, per cent
Carbon	0.030	0.08 to 0.12
Manganese	0.033	0.35 to 0.45
Phosphorus	0.127	0.050 to 0.070
Sulphur	0.017	0.050
Silicon	0.167	0.006

The two analyses distinctly show that there is a greater degree of oxidation takes places in making wrought iron than in making sheet steel. In making wrought iron, oxidation is the basis of the process. The raw material is pig iron of about the following chemical composition:

	Per cent
Carbon	3.50
Manganese	0.85
Phosphorus	0.55
Sulphur	0.02
Silicon	1.40

The pig iron is placed in the furnace and roll scale is used as the oxidizing agent to burn out the impurities. The silicon first is oxidized and is drained off as a dull red slag. The temperature at the start is about 2200 degrees Fahr. As the impurities gradually are burned out the temperature rises, until at the finish of the process the temperature is about 2600 degrees. Fahr. The iron becomes white hot as the carbon burns out, and is in a thick, pasty condition, at a high temperature; an ideal condition to promote oxidation of the exposed iron particles along with some slag particles which are not worked out.

The ball passes on to the squeezer to expel the slag and to work the ball into shape so that it can be fed to the rolls. The squeezed ball is then rolled into muck bar, which is of about the following chemical composition:

	Per cent
Carbon	0.058
Manganese	0.052
Phosphorus	0.116
Sulphur	0.017
Silicon	0.211

The muck bars finally are rolled into skelp which is of the following composition:

	Per cent
Carbon	0.040
Manganese	0.030
Phosphorus	0.140
Sulphur	0.015
Silicon	0.170

Sheet steel usually is made in the basic open-hearth furnace. The charge is made up of steel scrap and molten pig iron. It takes about eight to 12 hours to melt and refine the metal. The slag being lighter than the metal, floats on top. Hard iron ore, generally magnetic or lump hematite is used to burn out the impurities of the molten steel. Toward the end of the heat the steel is rabbled, that is, gently agitated by slowly moving a tapping bar back and forth in the bath. This helps to get the gas out of the steel and quiet the bath.

Quality of Steel a Factor

Highly oxidized steel when rolled is crumby, dry, and without luster. Good steel is plastic, malleable, cohesive, and rolls into a sheet with a tight, smooth surface without any fine cracks. These qualities are essential to make a sheet that will pickle right, and develop large fern-like spangles. Sheets for galvanizing usually are one-pass, cold rolled, the purpose of this treatment being to flatten the sheets and remove any

The author, Wallace G. Imhoff, is president, the Wallace G. Imhoff Co., 401 Highland building, Pittsburgh.

ragged edges left after shearing.

The spangles on wrought iron sheets galvanized under normal conditions average less than ¼-inch while on high-grade open-hearth steel the spangles are always more than ½-inch, and average about 1 inch. A poor grade of steel generally is brittle and often breaks in stamping and drawing. This same steel when pickled and galvanized usually shows small spangles. Highly oxidized steel is brittle and galvanizes with small spangles. White has shown by experiment that when wrought iron sheets and high-grade steel sheets were galvanized alternately in the same bath of molten zinc, that without a single exception the wrought iron sheets were covered with small dull rough spangles, while the steel sheets bore only bright large spangles. When the wrought iron and steel sheets with dull granular spangles were stripped, blisters were found under the iron base and not between the zinc and iron.

Blisters may be caused by the speed of the sheet through the galvanizing pot being too fast or, they may be due to hydrogen gas taken up in the pickling process. Sometime ago the writer conducted a large number of experiments on pickling, and the speed of the sheet through the zinc bath. By gradually increasing the speed of the sheet through the flux and through the metal, a speed was finally reached that developed blisters on the sheets. The direct cause of the blisters seemed to be due to the fact that sufficient time was not allowed to evaporate and dry off the water and acid carried over on the sheet from pickling operations. The result was that before the steam could escape it was trapped and held under the zinc coating. These sheets showed a small granular spangle. By slowing down the speed of the sheet again, the coating immediately changed to large

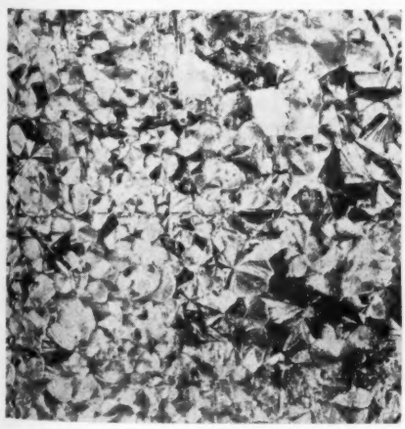


FIG. 3—SMALL SIZED SPANGLES ON A GALVANIZED SHEET

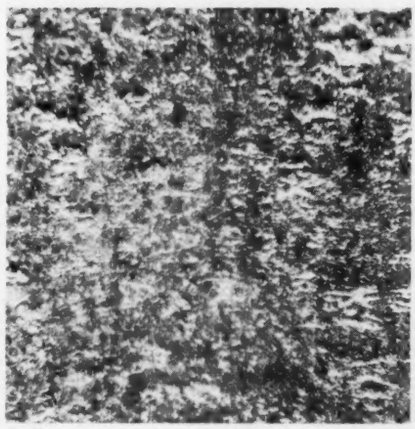


FIG. 4—BLACK SURFACE OF A FULL FINISHED SHEET. X36

fern-like spangles like those in Fig. 1.

The second cause of the small granular spangles is due to the absorption of hydrogen gas evolved in the pickling process. This condition involves for the time being a consideration again of the chemical composition of the metal being pickled, and the condition of the surface of the sheets. Fig. 1 shows the photograph of bright large fern-like spangles on a galvanized sheet; Fig. 2 shows the photograph of medium sized spangles on galvanized sheets; Fig. 3 shows the photograph of small spangles on galvanized sheets. These illustrations were originally made by Mr. White, and show clearly how desirable it is to obtain the large fern-like spangles. A poor grade of steel never shows large fern-like spangles.

Surface Conditions Illustrated

The extreme conditions of the smoothness and the roughness of the surface may be illustrated by comparing the surface of forgings and plates to the smooth surface of the full-finished steel sheet. Surfaces, which have been forged, have a heavy scale hammered into them, and usually are rough when pickled. Steel 14 gage and thicker is liable to have comparatively rough surfaces also. The pickling action is partly solution, dissolving the iron under the scale, and partly forcing the scale off by hydrogen gas developed by the chemical action of the acid.

Full-finished sheets usually are hot-rolled, cold-rolled, pickled, annealed, full cold-rolled, and reannealed. The scale is a light coating of ferric oxide. The surface of the sheet is extremely smooth and easy to pickle. The last sheets frequently are overpickled, or burnt. If the surface is not pickled properly the spangle cannot develop, and if it is overpickled or burnt, small spangles will result. Steel that is burnt in the pickle has a rough porous surface. Forgings with the heavy scale driven into the surface by the force of the blow from the hammer, often are difficult to pickle without pitting and burning the surface. These articles when galvanized are rough, and show a small spangle. Generally such articles are quenched in water and have no spangles.

Similar conditions prevail with wrought iron. The process of manufacture is productive of extreme phases of oxidation and the small particles of iron oxide and slag probably are mashed and ground into the surface during rolling. Magnified sections of wrought iron sheets show slag and iron oxide inclusions. During pickling some of these particles must be removed leaving the surface rough. Such a surface is ideal to take up and hold hydrogen from the pickle. Mr. White has determined the volume of hydrogen taken up in the pickling process and finds it varies with different kinds of metal. The results of his test to show the absorption of hydrogen follow:

	c.c. of hydrogen freed from 1 sq. in. metal
Titanium treated steel, large spangles	0.03
Basic open-hearth steel, large spangles	0.08
Wrought iron, small granular spangles	1.05
Basic o.h. steel, small granular spangles	0.80

These results indicate that iron and steel which produce small granular spangles of zinc when galvanized immediately after they have been pickled also take up large volumes of hydrogen, and this further indicates that hydrogen is the cause of the small spangles. This, of course, is a factor in pickling but perhaps not the ultimate cause. Good and bad steel pickled under identically the same conditions would reveal that the pickling may not be at fault, but that the real cause is to be found in

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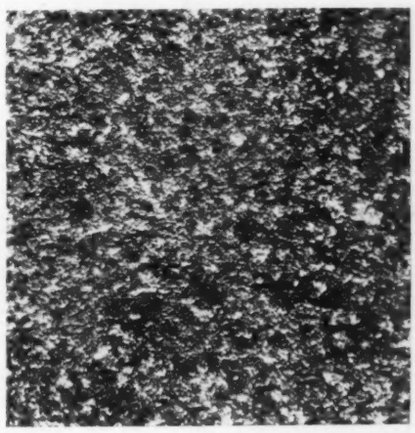


FIG. 5—FULL FINISHED SHEET AFTER PICKLING 15 MINUTES SHOWING OVERPICKLED SURFACE. X36

Agricultural tractors are being produced at lower cost than would be possible without the aid of alloy steel

Manufacturers' Research Broadens Use of Alloy Steels

By Herbert R. Simonds

BACK of the recent marked increase in the use of alloy steel has been an energetic sales campaign involving an intensive study of manufacturers' problems. The old adage that the world will beat a path to the door of the man who makes a superior mousetrap does not seem to work out in practice. First the world must somehow learn about this new mousetrap and secondly, even when it has learned it is reluctant to change from an old trap which is giving fair service.

Today it usually is necessary for the mousetrap manufacturer or the machine tool builder or the producer of alloy steel to put himself in the place of the user and actually demonstrate the savings which his product will effect. Realizing this, the Vanadium Corp. of America has been making a thorough study of its prospective customers' problems and while its interest has been chiefly in the use of various vanadium alloys, its conclusions well illustrate a modern trend in selling.

Alloy steels are used not only because of the engineering properties they possess, but also because many serious problems of manufacture, imposed by quantity production, are eliminated or more economically met by their use. For example, in the case of automotive crankshafts, engineering practice has progressed to the point where no particularly high physical characteristics are required from the point of view of service. This is due to the fact that manufacturers have returned to shafts of larger diameter and now are using more bearings per crankshaft. This eliminates the whipping action. In most cases shafts of ample size are accurately balanced and the lubricating systems are adequate. Thus failure through wear and breakage has been largely overcome.

Difficulties Are Encountered

This means that quenched and tempered carbon steel amply meets the service requirements, but it does not follow that quenched and tempered carbon steel is best suited to crankshaft manufacturing processes. Making crankshafts from quenched and tempered steel is burdened with certain inherent fabrication difficulties. These arise from strains which are set up when the shafts are quenched and which cause warpage. Some of the sources of these strains may be eliminated by careful practice but there are others which resist all efforts for their removal. Nearly all shafts which undergo quenching and tempering processes warp during subsequent machining and consequently must be straightened.

Straightening operations usually are not different nor expensive as such but the fact that they are necessary both limits and adversely affects the sequence and character of the machinery operations. Thus a straightening process which in itself may cost less than a cent a pound may so interrupt the flow of parts in process as to cause an overall expense of four or five cents a pound. Straightening processes interfere with the development of automatic and semiautomatic sequences and their expense may be translated as hindrance to labor saving.

Realizing this, engineers of the Vanadium corporation in conjunction

with some of the prominent automobile manufacturers undertook the elimination of straightening operations in crankshaft manufacture. From experience with large tonnages of carbon vanadium steel for locomotive forgings, it was realized that the physical properties of the quenched and tempered carbon steel generally used for crankshafts could be met or bettered by the use of untempered but normalized carbon vanadium steel. It was also known that a normalized steel was exceptionally free from internal strains. The problem then was to develop a technique of straightening at the normalizing temperature, after which the crankshaft would be free from subsequent warpage during machining or in service. It was found that shafts of this steel machined more uniformly and readily and were more easily balanced than the quenched and tempered shafts.

In practice the use of normalized shafts has increased machine shop production in some cases by as much as 25 per cent with the same equipment. In many plants this increase in production more than offsets the added cost of the alloy steel. Thus even disregarding quality, an alloy steel may be the means of reducing the cost of manufacture.

Like several other metals vanadium has a marked effect on the structure of steel. It is a high priced metal, much higher than nickel, chromium or molybdenum and its widespread use indicates peculiar properties in its effect on steel and steel alloys. The chief source of vanadium is Peru, where there are large bodies of high grade vanadium ore.

Vanadium has a strong affinity for carbon and when added to steel, it is found principally in the pearlite in combination with the cementite, although some is found in solid solutions in the ferrite. Vanadium cementite diffuses less rapidly than iron carbide and consequently, does not segregate in such large masses. This property, namely that of appearing in relatively minute particles,

Effect of dropping a 1-ton weight 25 feet on to the side of a standard car spring. Spring is made of 1 3/16-inch diameter alloy steel bar

contributes much toward greater uniformity. Vanadium carbide is not as readily soluble as iron carbide and therefore, has a greater thermal stability, or power to withstand elevated temperatures. It is this property which has been valuable in improving the quality of high speed tool steel.

Vanadium steel has slower grain growth during temperature increase until the 1700 degree Fahr. mark has been passed. This property is important, as it makes greater hardening possible by quenching from high temperatures. Such hardening in carbon steel would produce disastrously coarse grained structures. This property also contributes to the forgeability of the alloy. Vanadium steel forges about as readily as carbon steel and is less liable to injury from overheating. Its lack of air hardening effect insures greater freedom from cracking in the forging and subsequent heat treating operations. One of its most important properties is that of intensifying the effect of other alloys in steel, such as nickel, chromium, tungsten, etc.

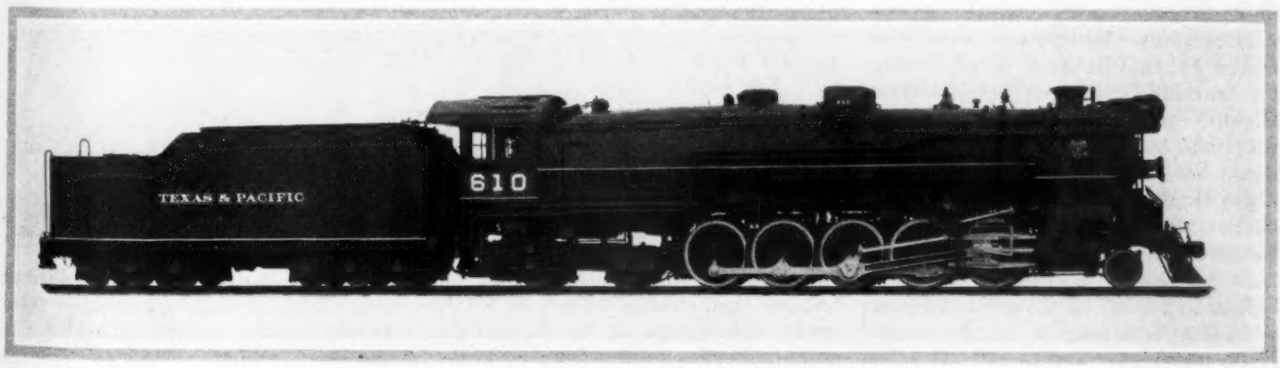
As a construction or production material vanadium is used principally with chromium or with straight carbon steel. Chromium-vanadium steel has a wide range of properties depending upon the carbon percentage. Automobile forgings, such as axles, steering arms, connecting rods and propeller shafts, when made of chromium-vanadium steel, usually have the carbon content between 0.25 or 0.35 per cent.

In the heat treated condition, these forgings are commercially machinable up to a brinell hardness of 320 and have an elastic limit of approximately 140,000 pounds per square inch. Oil hardened chromium vanadium gears are usually made with a carbon content of about 0.45 per cent and are extensively used in automobile transmissions. Test of such gears made at the Vanadium corporation laboratories gave the following average physical properties:

Elastic limit, 202,000 pounds per square inch; tensile strength, 213,000 pounds per square inch; elongation, 13 per cent; reduction of area, 45 per cent; brinell hardness number, 425.

Many automobile springs are made of chromium-vanadium steel with a carbon content of from 0.45 to 0.55 per cent. The typical physical properties of such springs are as follows:

Elastic limit, 202,000 pounds per square inch; tensile strength, 200,000 pounds per square inch; brinell hardness number, 418; and the angle of



This latest type of locomotive uses alloy steel extensively

bend without fracture, 180 degrees.

The same steel is used extensively for locomotive and car springs. Axles and connecting rods and other similar parts for locomotives are made of carbon vanadium steel with 0.70 to 0.95 per cent of manganese and with the carbon content running from 0.45 to 0.55 per cent. The following typical properties are secured after normalizing followed by a drawback or low anneal.

Tensile strength, 98,000 pounds per square inch; yield point, 65,000 pounds per square inch; elongation, 25 per cent; and reduction of area, 50 per cent.

This steel also responds well to quenching. Typical properties when quenched in water at 1600 degrees Fahr. and then drawn at 1100 degrees Fahr. are as follows:

Tensile strength, 132,000 pounds per square inch; elastic limit, 101,000 pounds per square inch; elongation, 21 per cent; and reduction of area, 50 per cent.

Automobile crankshafts made of this steel, are normalized at 1650 degrees Fahr. and die-straightened at the normalizing heat.

Castings of carbon vanadium steel are used extensively for locomotive frames and crossheads. Frequently these castings are given a double treatment similar to that mentioned in connection with locomotive forgings. In this way specifications calling for the following properties are readily met:

Tensile strength, 80,000 pounds per square inch; yield point, 50,000 pounds per square inch; elongation in 2 inches, 20 per cent; and reduction of area, 40 per cent.

A recent alloy developed for a helical spring for railroad work contains silicon, manganese and vanadium. Its approximate analysis is as follows: Carbon, 0.90 to 1.00; silicon, 0.50 to 0.75; manganese, 0.40 to 0.60; and vanadium, 0.15 to 0.20 per cent.

Bars of this alloy, when quenched in oil from a temperature of approximately 1600 degrees, Fahr., and then drawn back at 860 degrees, Fahr., gave the following qualities:

Tensile strength, 270,200 pounds per square inch; yield point, 214,800 pounds per square inch; torsional elastic limit, 128,000 pounds per square inch; and brinell hardness number, 444.

Practically all high-speed tool steels contain vanadium which varies from 0.50 to 3.00 per cent.

In introducing alloy steel into the production processes of large manufacturing plants, it frequently is necessary to do considerable educational work in connection with the heat treating problem. However excellent the property of an alloy steel may be, high production economy cannot be secured in most manufacturing operations without correct heat treatment.

Equipment for heat treating must be modern and adequate. Furnaces must be well designed and capable of maintaining a uniform heat and of being easily regulated. The many variables in heat treating and in the choice of alloy steel for various purposes, make it possible to secure similar physical properties in many different ways. It is for this reason that it is advisable for the producer of an alloy to develop a material and a technic of heat treatment to fit definite needs of his prospective customer and then to sell his material on the basis of what it will do and finally, to see to it that correct conditions are maintained to substantiate his claim. Careful consideration should be given to such characteristics as uniformity in quality, forgeability, including not only how the steel works in the die, its freedom from cracking during its operation, but also how it is affected by the forging heat, and its machinability. All of these properties affect continuity and the cost of production, and are generally the criteria on which the selection of such steels is made for a given purpose.

New Hangars at Houston Airport Are All-Metal

THREE large hangars recently were erected in Houston, Tex., corrugated iron sheeting being used to cover arc welded, steel superstructures. Estimates were received by the Houston Airport Corp. on various types of construction. Rigidity and strength, fireproof qualities and low cost of the type selected were the deciding factors. These hangars were the first to be built employing the new method of construction. They were designed and built by the C. J. Frankel Co.

Each of the hangars is 75 feet wide, 125 feet long and approximately 50 feet high. The arches are made up from channel shape sections cut to form the arch when butted end to end and welded together. The entire fabrication of the arches was completed on the ground, an arch being raised into position and held in place by the welding of the channel purlins to the arches. The columns at the closed end are also channel sections. The framework of the monitors are composed of angles and channels. The completed arc welded steel framework of one of the hangars is shown in the accompanying illustration. The steel sash in the sides and end wall were arc welded in place. Two portable gas-engine driven welders made by the Lincoln Electric Co., Cleveland, were used to supply the welding current.

Study Production, Distribution and Utilization of Fuels

TWENTY-SEVEN papers covering the use of solid, liquid and gaseous fuels in all fields were presented at the second National Fuels Meeting held at Cleveland, Sept. 17 to 20, under auspices of the Cleveland section of the American Society of Mechanical Engineers. Registration exceeded 1500 members and guests. Two sessions were held each morning and afternoon. Trips of inspection were made to the Fairmount pumping station, Cleveland; the Avon station of the Cleveland Electric Illuminating Co., Avon, O.; two plants of the American Steel & Wire Co., Cleveland; and the Cleveland airport. A smoker was held Monday evening, an informal banquet Tuesday evening and a dancing party Wednesday evening at Euclid Beach park.

Engineers Interchange Ideas on Combustion

IN SPEAKING on the "Perils and Profits of Research," at the opening session, Monday morning, Thomas Baker, president, Carnegie Institute of Technology, Pittsburgh, characterized research as both a curse and a blessing: A curse to those who do not employ it and who are in competition with those who utilize scientific experience and technical skill, and a blessing to enterprises which owe their progress to methods of the scientist. With the problem of conservation of natural resources becoming more imminent, he stated, industry soon will unite with the universities in working out advanced scientific fuel form.

At the "Fuels Characteristic Session," Monday afternoon, A. C. Fieldner, chief chemist, bureau of mines, Washington, pointed out that use classification should be secondary to scientific classification and should be correlated with the scientific classification so far as possible. In America he continued, we have been concerned more with collecting the usual analytical data of approximate and ultimate analysis and heating values than we have with the constitution of the coal itself.

Characteristics of fuel flames are affected by the composition of gases arising from the fuel bed and the manner in which oxygen is supplied for their combustion. Hydrocarbons either in gaseous form or as tar vapor are found only at the surface of the fuel bed in any measurable quantity. This was the purport of a paper, "Fuels and Their Flame Characteristics with Reference to Combustion Values and Furnace Space Requirements," by Henry Kriesinger, research engineer, Combustion Engineering Corp., New York, and B. J. Cross, associated with the same company. Mr. Kriesinger emphasized that when coals are burned in fuel beds on a grate, high rates of combustion or gassification are obtained by bringing oxygen rapidly in contact with the coal.

At the general session, Monday afternoon, simultaneously with the session on fuels characteristics, William B. Chapman, president, Chapman-Stein Furnace Co., Mt. Vernon, O., predicted that boilers some day will be fired with producer gas. Before gas producers can be made suitable for firing large boilers, the speaker contended, their capacities must be increased to 100 pounds per square foot per hour and they must be suitable for location under or within the boiler. Moreover, they must handle slack coal, producer fire beds must require no hand poking and the present proportion of steam required in the air blast must be greatly reduced.

H. D. Smith, assistant to the president, Majestic Collieries Co., Bluefield, W. Va., in speaking on "Washing and Preparation of Coal," pointed out that in selecting a cleaning plant it is important to know the quality of the final product desired and also the use to which it will be put. It has been found, the speaker stated, that the better the coal is washed, producing a low ash product, the lower becomes the fusing point of the ash.

At the industrial session, Tuesday morning, James H. Herron, Cleveland, spoke on "Industrial Furnace-Efficiency Economic Consideration" and W. E. Rice, bureau of mines, Pittsburgh, on "The Use of Fuels in Tunnel Kilns." A paper entitled "Present Tendency of Boiler-Water Conditioning," was presented at the heat transfer session by R. E. Hall, Hall Laboratories, Pittsburgh. Actual results that have been obtained from various boiler installations were brought out at this session in a paper entitled "Recent Developments and Improvements in the Baffling of Vertical Boilers" by A. C. Danks, president and treasurer, Ashmead-Danks Co., Cleveland. Advantages which accrue from cross-baffle boiler operations, as mentioned by the speaker, include increased rating available when changing from vertical to this particular type; reduction in stack temperature; lower draft drop through the boiler; and, elimination of bed gas and of dust pockets.

The contention of L. T. Work, department of chemical engineering, Columbia university, New York, who spoke on "Fineness of Pulverizing Fuel as Affected by Mill Types" at the powdered fuel session, Tuesday afternoon, was that slagging and erosion of walls, carbon loss in the ash, carbon monoxide in the stack gases and dark smoke result from coal which is too coarse for a given setting.

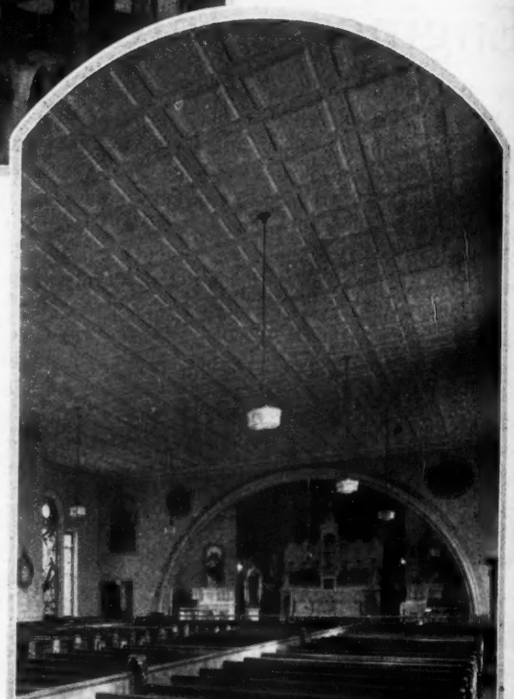
The present state of the art of collecting dust from chimney gases in powdered fuel installations was described and some solutions of the difficult problem were presented by K. Toensfeldt, engineer, Combustion Engineering Corp., New York. The speaker reviewed briefly the earliest application of means for collecting dust on a large scale, described various types of equipment that have been tried with powdered fuel dusts and presented considerable performance data.

General features that distinguish the unit system of coal pulverizers from the central system of using pulverized coal were presented at the close of the powdered fuels session, Tuesday afternoon, by John Blizard, head, research department, Foster Wheeler Corp., New York. The speaker pointed out that the unit system is particularly suitable for small boilers and its use gradually has been extended to large boilers because of the advantages which consist of dispensing with dryers, a system for transporting powdered coal from the pulverizer out to the boiler room, and feeders and bins for the powdered fuel.

(*Concluded on Page* 779)

Large Uses of Steel in Small Ways

Metal Ceilings
125th Article



Steel ceilings in homes, churches and other buildings do not crack through vibration. The sheets are formed under power presses

THE use of sheet steel as a covering for ceilings is steadily increasing. Architects are discovering that unusual artistic effects may be obtained, and are introducing metal ceilings into the finest private residences and churches.

A leading manufacturer of metal ceilings estimates that 100,000 tons of sheet steel enters into this product each year in this country. One manufacturer alone uses 15,000 tons for this product each year. This is in addition to a considerable amount of steel used in the construction of dies. One side of the die, known as the hard die, is cast from a special steel composition which avoids shrinkage in cooling and which combines toughness under impact, with good wearing qualities. On top of this hard die a soft metal die is cast. Usually this is done right on the stamping machine, the soft metal being cast to the movable or upper part of the press. The soft die wears out much more frequently than the hard die and is replaced by merely casting a new soft die from the hard die.

The usual type of press for making metal ceilings is known as a drop press. The upper die head is raised a few feet in its guides and allowed to drop on to the lower die. The sheets to be formed are fed between these two dies. These sheets are usually 29 or 30 gage, open-hearth, single pass, cold rolled steel of a quality known as dead soft annealed. Galvanized sheets sometimes are used but difficulty with chipping under the action of the dies has made the painted sheet more popular. At first, the metal ceiling manufacturers painted the sheets, but they persuaded the rolling mills to put in equipment for painting the sheets before shipping them. This painting equipment consists of a stand of rolls wrapped with muslin or other soft material with the lower roll partly emerged in a tank of agitated or circulating paint solution. The upper roll which is in contact with the lower picks up enough paint from the lower roll so that both sides of the sheets are painted in one operation as they are passed through. A special paint has been developed on a zinc base which stands the action of the stamping without any tendency to crack. The sheets usually are purchased in the width desired and in a length which is a multiple of the square or rectangle which is being stamped.

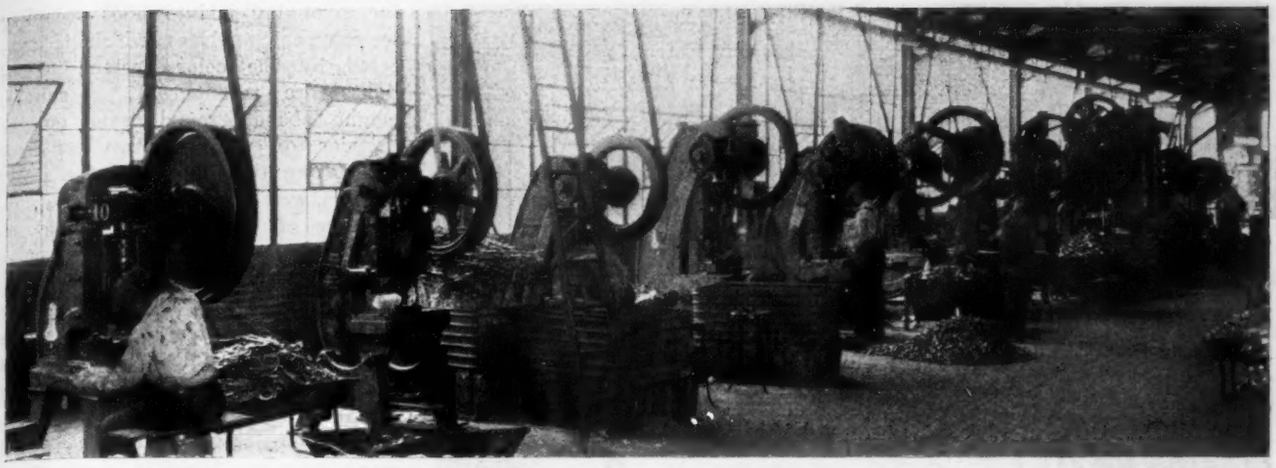
All sorts of ingenius devices are used to create novel effects in stamping. By careful indexing, a square impression may be reserved so that one design covers a rectangle equal in size to two squares. Skilled artists are employed in working out the design. For fine residences metal ceilings must be artistically designed and accurately made. The joints must not show and the method of attaching must be concealed.

The hard dies weigh about 700 pounds each and cost from $300 to $750. Several concerns have specialized in the production of the dies. One of the largest is in Ohio, and at this plant the foundryman, the metallurgist and the artist meet. The artist makes his plaster model. From this the foundryman makes his mold and the metallurgist provides a steel alloy which will stand up under the severe service of thousands of repeated shocks.

THIS is the one-hundred twenty-fifth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Swords	*Bathroom Fixtures*
Paving Guards	*Snow Fences*
Reaction Kettles	*Stairs*
Fire Screens	*Cork Screws*
Voting Machines	*Universal Shafts*
Display Racks	*Sewing Machines*
Steel Stamps	*Lanterns*
Wire Screens	*Cleats*
Typewriter Spools	*Axes*
Chain Hoists	



Battery of trimming presses located in the heat treating building which are driven either direct or from a lineshaft

Sequence in Forge Shop Operation

Provided by PLANT DESIGN

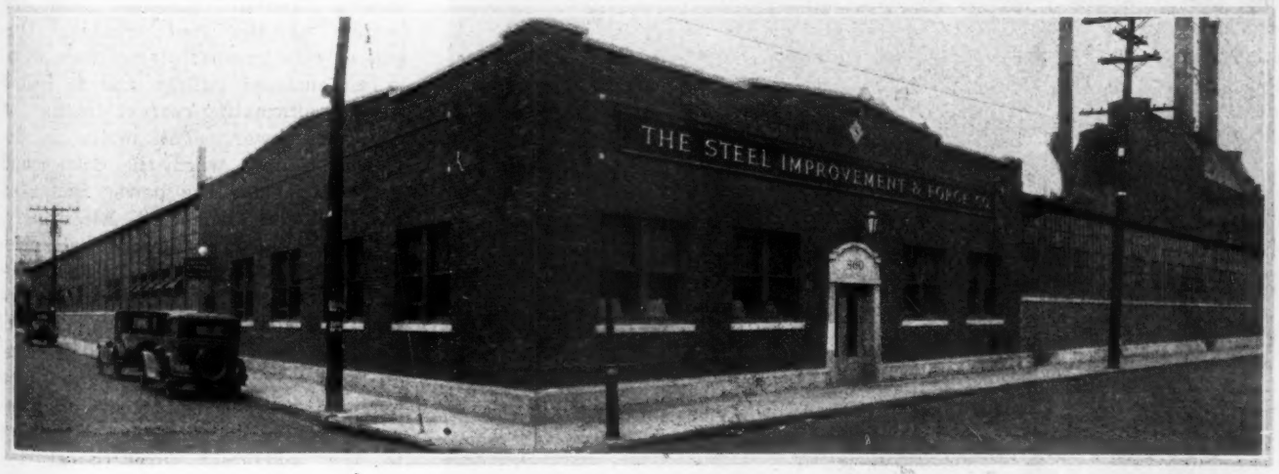
Heat Treating Furnaces Controlled Automatically—Recording Instruments Mounted on Centrally-Located Panel

By John D. Knox

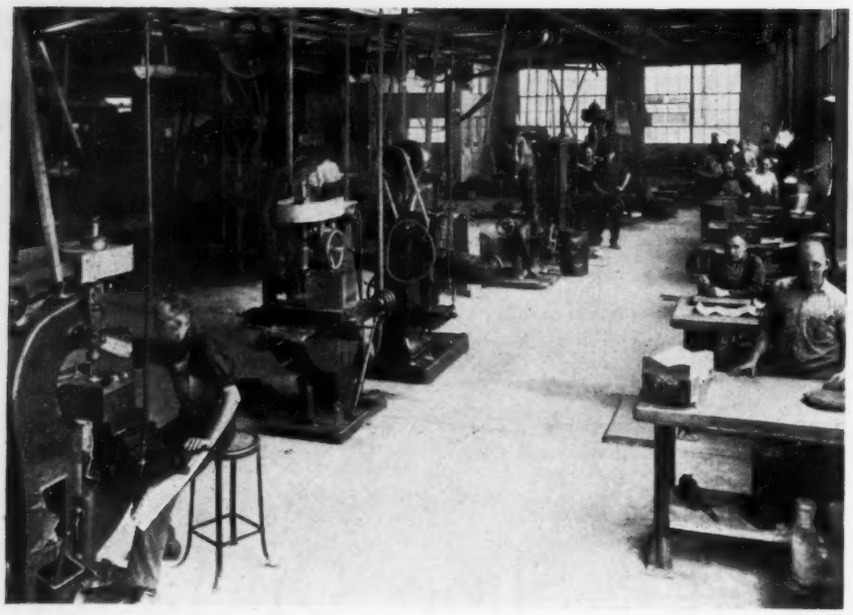
GROWTH of business necessitates plant enlargement but if lack of space prevents extension work being undertaken then the only resource open is to seek new quarters. This was the situation with which the officials of the Steel Improvement & Forge Co. recently were faced. The company, incorporated in 1914, occupied quarters on Windsor avenue, Cleveland, up until the first week in August when it moved its equipment into a new and modern plant on Addison road. New equipment also was purchased and installed. The site, occupying over 4½ acres, is enclosed by a steel wire fence. Construction of the plant was started April 1 and the first forging was completed August 6. Products manufactured by the company include all kinds of forgings of plain, high-carbon and alloy steels and stainless materials.

Special consideration was given to the design and construction of the various buildings to avoid all back tracking of work in the process of manufacture. Raw material enters the plant at one end, passes from one department to another in sequence and leaves at the opposite end without any semblance of confusion.

The management holding the opinion that if working conditions are right the product will be satisfactory made every effort to cater to the welfare of its employes. A sanitary room, faced with brown tile, is located near the plant entrance. Numerous wash bowls and shower baths are installed on the first floor and individual steel lockers on the second. The air in the hammer department is changed completely every three and one-half minutes by 19 ventilators installed over the peak of the build-



The structure joining the office building at the right houses the diemaking department; the shop building shown in the distance at the left houses the heat treating department



Diemaking shop, showing the individual benches provided for the diesinkers

ing. Each ventilator is 54 inches diameter. The building housing this department is sided half way down with glass mounted in steel frame work, the remaining distance being closed off when conditions warrant by rolling doors. The various departments are heated during the winter by a Skinner-type ventilator which uses the exhaust steam from the hammers at about 5 pounds pressure.

The hammer department is housed in a building 60 x 220 feet which runs east and west. Paralleling this structure is a building 60 x 220 feet which houses the heat treating, trimming, cleaning, and shipping departments. Between these two buildings is the cooling yard, 40 x 200 feet. At the eastern end of the hammer and heat treating department is a building running north and south which houses the die making department, the chemical and physical laboratories and the general offices.

A railroad siding enters the plant enclosure from the west and terminates near the extreme eastern end of the plant. Over this track raw materials, such as coal, oil, forging steel bars, etc., are brought into the plant and finished material dispatched to the customer.

A 10-ton crane built by the Cleveland Crane & Engineering Co., Wickliffe, O., and spanning the storage yard, facilitates the handling of the raw forging steel from the cars and for arranging it into piles according to chemical analyses which is indicated by the color system. Flood lights are mounted at a suitable height above ground level on the exterior of various plant buildings and during the night turn the stock-yard is well illuminated for the convenience of the crew. A leanto extending into the storage yard houses two electrically-driven shears made by the Cleveland Punch & Shear Works Co., Cleveland. This shearing equipment is capable of cutting steel bars in a cold state up to 4 inches square and of 0.50 per cent carbon.

Twenty hammers of the board and steam type are installed in the forging department. The board hammers range in size from 1000 pounds falling weight up to 6500 pounds; the steam hammers range from 1500 to 3000 pounds. The 6500-pound board hammer is of the four-rolled type and was built by the Erie Foundry Co., Erie, Pa. It is one of the comparatively few board hammers of this capacity installed in this country. In laying out the forging department over-sized foundations for the hammers were installed to take care of larger units should conditions warrant. The foresightedness on the part of the officials in this direction already has proven beneficial inasmuch as a hammer now in use is to be replaced by one of larger capacity immediately.

All furnaces serving the hammer department are oil fired, the fuel oil being stored in four underground tanks having a combined holding capacity of 80,000 gallons. The oil is pumped into the various furnaces through a heating system furnished by Tate-Jones & Co. Inc., Pittsburgh.

The hammers are arranged in two batteries separated by a center aisle-way which runs lengthwise of the forging department. The board-drop hammers are belted to a centrally-located lineshaft mounted near the bottom of the roof trusses. One end of this lineshaft terminates within an enclosed gallery and is belted to an alternating-current motor of 150 horsepower. The motor is designed so that when the 6500-pound hammer is idle, the power factor of the plant is corrected accordingly. In this gallery are located all electric controls; it also houses two 5400-cubic foot blowers built by the General Electric Co., Schenectady, N. Y. The air from each blower is conducted through a straight pipe mounted over each battery of hammers and is delivered by downtakes to the individual furnaces at 1½ pounds pressure per square inch for combustion purposes. The furnaces

View of some of the board-drop hammers installed in the forging department

serving the large hammers are installed at the rear of the hammer; on the smaller type units the furnaces are located at the side. By this arrangement the heat losses of the bar while being transferred from the furnace to the dies and the fatigue of the hammermen are minimized. Incidentally, each hammerman is provided with a large steel locker equipped with shelves for storing various tools and hammer parts.

Steam for operating the hammers is generated in a power plant housed in a separate brick building near the northeastern corner of the plant site. Coal in standard hopper cars is brought into the plant over the railroad siding which serves the steel storage yard, the cars being spotted at the side of the power house. The fuel is unloaded into a track hopper, which is covered by grating, and is conveyed to an elevated storage hopper. From this hopper the fuel is fed by gravity to the boiler stoker which was built by the Combustion Engineering Co., New York. When the storage hopper is full the excess coal hoisted by the conveyor is transferred to the main storage pile on the exterior of the building. Steam is generated in a 300-horsepower boiler of the Connelly type, water in the steam lines being removed by a vacuum system. The steam pressure is regulated automatically. When the pressure is below normal the fan for supplying air for forced draft is operated at increased speed and vice versa.

A large diemaking department operated in conjunction with the plant, is equipped with lathes, planers, shapers and other machine tools. Special attention has been given to the lighting condition through the medium of a monitor-type roof and an abundance of windows in the side walls along which the benches for the diesinkers are built. Diesinkers are provided with individual benches, the tops of which are covered with stainless steel. A well-equipped chemical and physical testing laboratory occupies a room closed off from the diemaking department. Under the direction of a competent metallurgist chemical analysis of the various grades of forging steel are checked and physical investigations of the finished product made. Between the diemaking and hammer departments a special room is set apart for the storage of dies. These are filed in an orderly fashion in steel racks pending future requirements of the custimer. The die storage department was located between the die and hammer shop to expedite the transfer of dies to the hammers or to the die room for maintenance.

On small forgings the flash or surplus metal is trimmed from the pieces cold. From the hammer shop the pieces are transferred to the cooling yard, located between the hammer and heat treating shops, where they are allowed to remain until cool enough to handle. Then they are removed to the trimming room, which is located in the heat treating building. All forgings in the process of production are handled in steel skid-type boxes by electric lift trucks of Baker design. The trimming room is equipped with a battery of 12 geared presses including a 600-ton coin press, driven either direct or with belts from a centrally-located lineshaft. The latter is actuated by a 50-horsepower motor. Provision has been made for the installation of a second battery of trimming presses.

Many of the forgings made by the company require heat treating before being shipped to the customer. For this purpose five gas furnaces and various quench tanks are provided in the heat treating department to meet trade requirements. Natural gas was chosen as the fuel for firing these furnaces because of the ease it affords in holding to uniform temperatures. In order to eliminate the human element as far as possible, the temperature in the furnaces is automatically controlled. On a panel board, located near the executive offices, are mounted various recording instruments built by the Wilson-Maeulen Co., Inc., New York and the latest type of automatic control devices which operate at the furnaces. The control valves were supplied by the Geissinger Furnace Control Co., Detroit.

Certain kinds of forgings such as automobile connecting rods, etc., require on the drawing heat a restrike to assure straightness and this operation is performed on a 1000-pound steam hammer installed in the heat treating department. All forgings are cleaned by sandblasting before leaving the plant, a machine built by the Pangborn Corp., Hagerstown, Md., being provided for this purpose. Air used in the sandblasting machine is supplied by a compressor which is operated by a 62-horsepower motor. The shipping department occupies the west end of the heat treating building. Finished forgings for local delivery frequently are shipped by motor trucks and to facilitate loading, the roadway has been excavated so that the beds of the trucks are level with the shipping platform. Forgings intended for domestic shipment are handled by electric trucks to railroad cars. These trucks operate on a concrete roadway extending from the shipping department to the loading platform which is built on the railroad siding at the northern side of the plant. The platform also is served by the 10-ton traveling crane spanning the storage yard.

Group of heat treating furnaces which are fired with natural gas. The temperature is controlled automatically

Internal Displacement Principle Aids Forging Practice

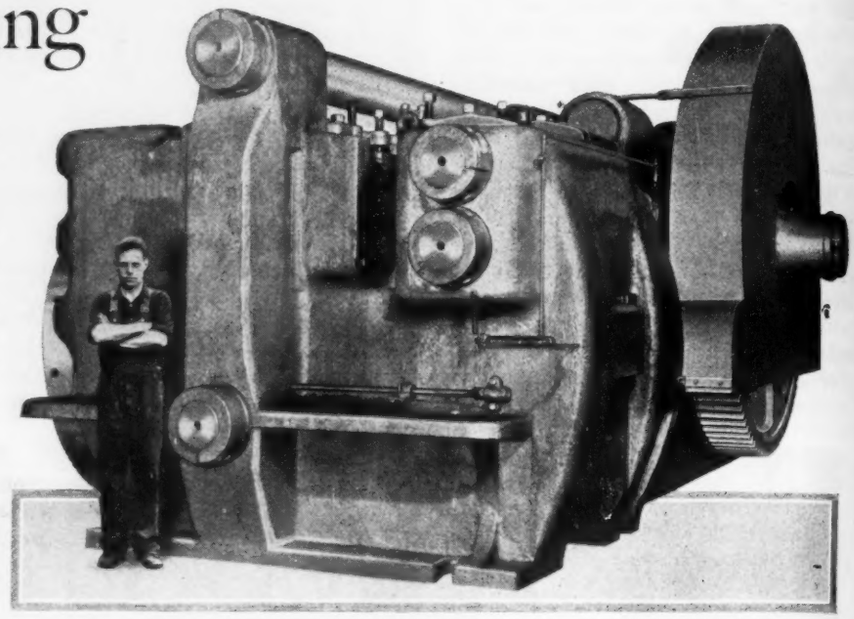


Fig. 1—One of the largest forging machines ever built. Weight 365,000 pounds

OF UNUSUAL interest to the man who uses forgings, is the marked progress that has taken place in the design of forging machines and in the character of the forgings which these new machines produce. Recently at its plant in Tiffiin, O., the National Machinery Co. exhibited a number of new types of high-duty forging machines in operation. The feature that evoked the greatest interest was the remarkable economy with which machine-made forgings now are being produced.

These forgings have an accuracy of size and shape that closely approaches die casting. As a result of this accuracy, they require less metal to forge and less machining to finish than heretofore has been possible in forging practice. Automobile transmission and differential gears are finished completely with a depth of cut of only 1/32 to 1/16-inch. Duplicate forgings are held remarkably close to size. For example, ball and roller bearing races, 3 inches diameter, are held to a variation of 0.010-inch diameter. The ends of sucker rods used in oil well pumping are upset and held to a variation of 0.002-inch on a 1-inch diameter.

Even greater economies are effected on forgings with holes. By a comparatively recent development, known as internal-displacement forging, holes are being formed on the forging machine. By this method, metal that formerly was removed by drilling and wasted in the form of drill chips, becomes a part of the forging itself. These internally-displaced holes are so accurately forged that only 0.015 to 0.020-inch of metal removal is required for finishing. As a result, they are finished either by broaching or reaming. Internal-displacement forgings and the dies in which they are made are shown in Figs. 2, 3 and 4.

By far the majority of these machine-made forgings are produced without flash; and in the few instances where flash occurs, it is so slight that it is trimmed in the forging machine. Separate trimming operations thus are made unnecessary. Another saving results from the fact that 90 per cent of machine-made forgings are sheared from the bar while hot, in the forging machine. This does away with the shear and the operating crew required to shear the cold stock. Then, too, cold shearing requires annealed stock for which an extra charge of approximately $5 a ton is made. The hot shearing in the forging machine saves this amount.

Not all forgings can be made on forging machines. However, the new type forging machines are designed to make a range and variety of work heretofore thought impossible; and where forgings can be made on these machines, a saving of 20 to 30 per cent in material is afforded.

In order to produce these low weight, accurate forgings, certain improvements in forging machine design were necessary. Bed frames had to be stiffened and made more rigid. The machines on exhibit were notable for their shortness and compactness and the depth and strength of the cross section of the bed where the forging strains occur. A large percentage of the bed is placed below the floor line. In addition, massive tie bars, from two to three times the usual diameter, were located at the top of the bed to resist tension.

Of equal importance to accurate forging is the design of the heading and grip slides shown in Fig. 5. Extreme length is provided for the heading slide by the overarm construction which extends over and beyond the

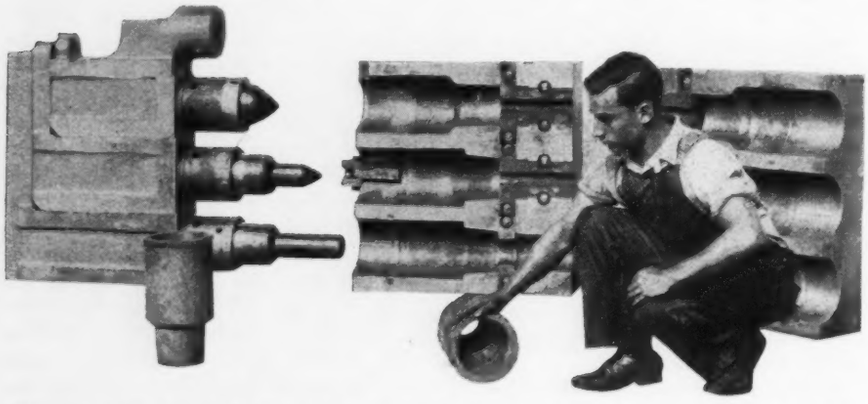


Fig. 2—Dies for forging a hollow tool joint used in oil well drilling. This forging is 14 inches long, and its outside and inside diameters at the large end are 8¼ inches and 6⅛ inches respectively. This piece was forged on the machine shown in Fig. 1

crankshaft. This added length, combined with the narrow width, gives an accuracy of movement to the heading slide without which internal displacement forgings could not be made.

This same principle is applied to the design of the grip slide which carries the moving die. The long outboard support is an important factor in securing a close registration of the die impressions. This construction, combined with a powerful gripping action, keeps the dies closed against the hydraulic action of the heading tools on the hot stock. The cocking or wobbling of the old style grip slides that allowed the dies to open up and cause swollen shanks and part line flash have been eliminated. Incidentally, getting rid of the part-line flash has increased materially the die life. The washing action of the hot metal squirting between the faces of the dies made short work of the edges of the die impressions and frequent redressing was the result. Obviously, where the dies are kept closed this is prevented.

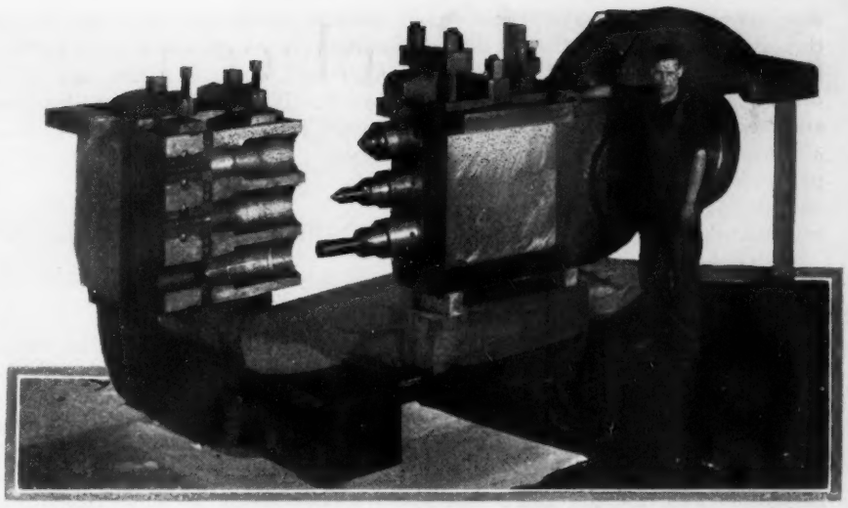


Fig. 5—The heading and gripping slides, showing their outboard bearing construction. These slides are used in the machine shown in Fig. 1

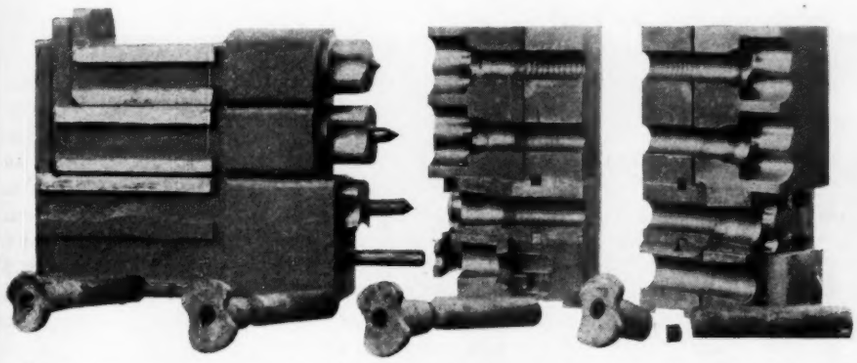


Fig. 3—Dies and successive steps in forging a tractor hub. The hole is 1 9/16 inches diameter by 5⅝ inches long

To prove the worth of this new type of bed design, of the long heading and gripping slides with their outboard bearings, and the increased gripping power of the dies, a comparative test recently was made. The forgings made off of the bar were large diameter, high-carbon rings. The maximum permissible variation in the width of these rings was 0.040-inch. On the old machine, only two to three rings could be made in one heat off of the bar. On the new machines, eight rings were made without exceeding the tolerance limit.

The new machines have air-operated trips instead of foot treadles. The operator presses this air trip with the toe of his shoe without disturbing his balance; and with no more effort than is required to press the accelerator of an automobile. To obtain fast starting, a 4-abutment starting clutch is used. This means that the machine starts in a quarter revolution, and less, of the main driving gear. This quicker starting means less temperature drop per forging or more forgings per heat off of the bar and more forgings at the end of the day's run.

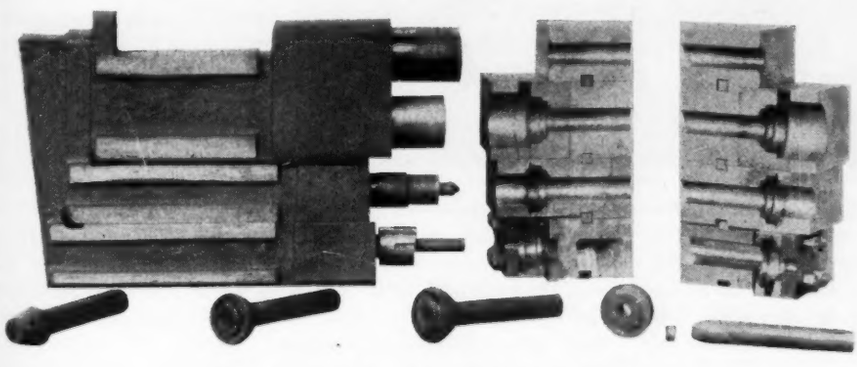


Fig. 4—Dies for forging a gear blank

Considers Fuel Problems

(*Continued from Page* 773)

All civilized nations are deeply interested in the world's fuel problems. This was the contention of F. R. Wadleigh, consulting engineer, New York, who was the first speaker at the general session, Tuesday afternoon. In the speaker's opinion the governmental and private work on coal research is distinctively behind similar work undertaken and now carried on by foreign governments, technical bodies and trade associations.

The only correct methods of evaluating bids are those that are equivalent to determining the minimum sum of fixed and operating charges, thermal performance, other operating costs and influence upon other plant equipment or design, stated F. M. Van Deventer, construction department, H. L. Doherty & Co., New York, in discussing "Determination of Economic Value in the Selection of Power-plant Equipment." He asserted that such considerations as return on the investment, time required for saving to liquidate first cost, cost per unit of weight, capacity of service, etc., do not indicate economic value and should not be used in the evaluation of bids.

At the refractories and stoker session, Wednesday morning, C. P. Hirschfeld, chairman research department, Detroit-Edison Co., Detroit, spoke on "Boiler Furnace Refractories." In reviewing certain misconceptions relating to the characteristics of fire clay brick he stated that the compressive strength of fire brick is

more important when hot than when this strength is determined cold. It is doubtful, he stated, whether any brick can be chosen by chemical analyses. This session was brought to a close with the presentation of a paper entitled "Stoker Advantages and Difficulties" by Theodore Maynz, construction engineer, Cleveland.

Wednesday morning's session, dealing with central stations, opened with the presentation of a paper, "Development in Recent Design of Stoker Fired Equipment" by J. G. Worker, assistant to the president, and J. S. Bennett, mechanical engineer, American Engineering Co., Philadelphia. The power plant designer need have no hesitation in installing a single stoker-fired unit of high evaporation capacity, Mr. Worker stated, as the inherent overload capacity of a stoker offers unbelievable flexibility. A summary of experiences of powdered coal developments of the St. Louis central station from standpoints of performance and of dollar value was related by E. H. Tenney, chief engineer, power plant, Union Electric Light & Power Co., St. Louis.

Spangle Is Influenced by Pickling

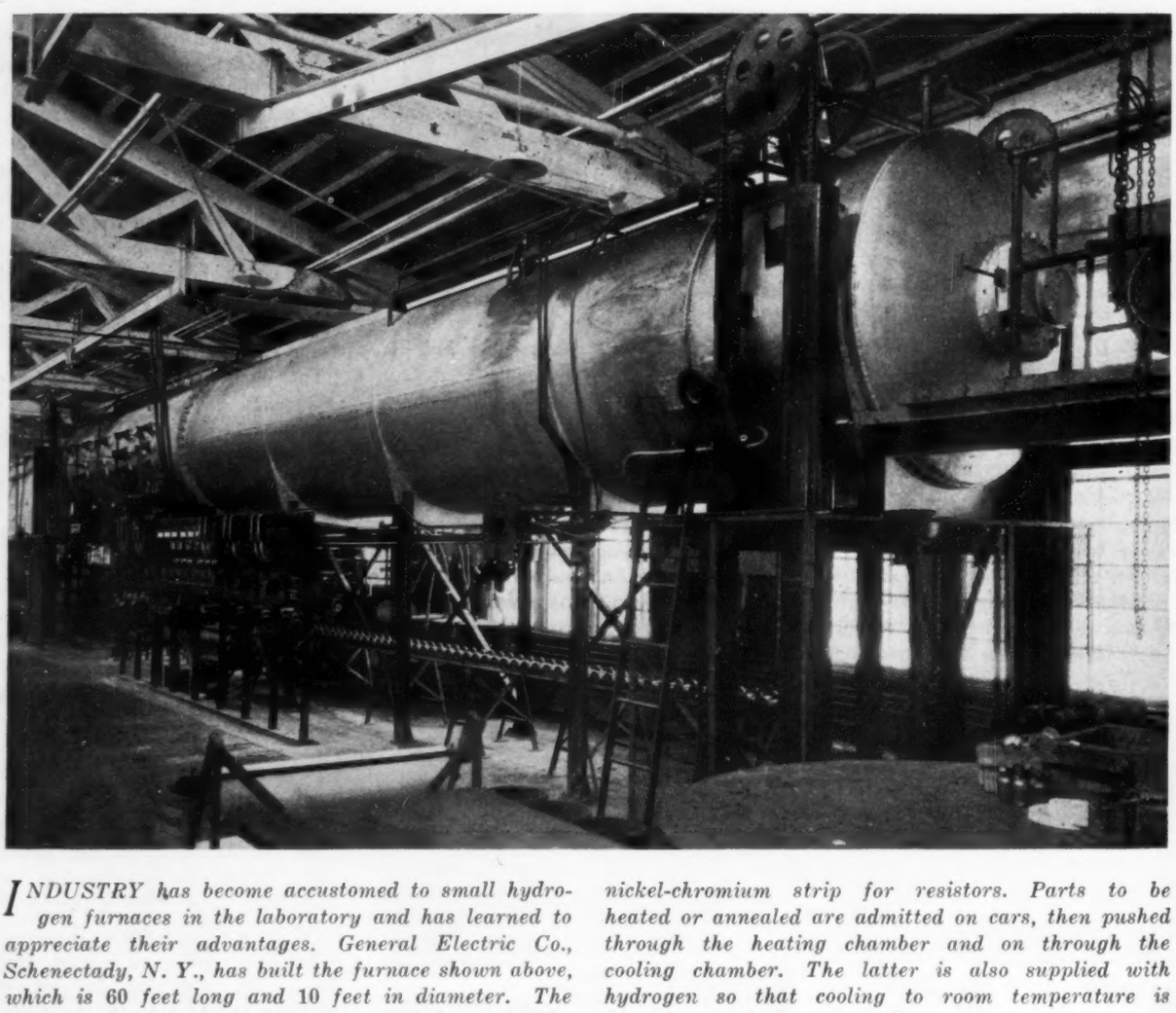
(*Concluded from Page* 769)

the oxidized condition of the steel.

An incident of this kind developed in a plant where sheet steel products were made. In selecting the blanks for the bottoms and body sections for a large run on tubs and pails, two different kinds of steel were used. When the articles were galvanized the body section had large spangles and the bottom section small granular spangles. The next article had two out of the three body sections with small granular spangles, and the third body section and the bottom with bright large fern-like spangles. The same thing happened with the tubs. This example shows the fault was with the kind of steel used for the body sections.

The general conclusions seem to indicate that the pickling of steel does influence the development of the spangle to a large extent, but that good steel properly pickled will develop a large fern-like spangle. The factors that cause small granular spangles originally develop in the steelmaking process. Once developed, the only possible means still available to eliminate them entirely, or to at least minimize the effect of the development of hydrogen gas in the pickle, is to use a good inhibitor. Careful use of an inhibitor also will keep from burning, or overpickling the surface.

Adapts Laboratory Principle To Plant Needs



INDUSTRY has become accustomed to small hydrogen furnaces in the laboratory and has learned to appreciate their advantages. General Electric Co., Schenectady, N. Y., has built the furnace shown above, which is 60 feet long and 10 feet in diameter. The heating chamber is 20 feet long and is served by nickel-chromium strip for resistors. Parts to be heated or annealed are admitted on cars, then pushed through the heating chamber and on through the cooling chamber. The latter is also supplied with hydrogen so that cooling to room temperature is done in a reducing atmosphere.

Machine Tool and Engineering Exhibition at Olympia, London

British Exhibit Reflects Progress in Design of Machine Tools

By Vincent Delport

European Manager, Iron Trade Review

FIVE thousand tons of machinery were displayed at the fourth machine tool and engineering exhibition organized at Olympia, London, Eng., by the Machine Tool Trades association, Sept. 5 to 22. The exhibition was opened by the Right Hon. W. C. Bridgeman, first Lord of the admiralty, and the ceremony was attended by delegations from Canada, Australia, France, Germany and other continental countries. The interval of four years between each exhibition enables developments in the machine tool industry to be noticeable.

A visit to Olympia this year shows that since 1926 progress has been made more especially toward greater efficiency in repetition work and safety of the operator. The speed and feed of nearly all machine tools has considerably increased, and attention has been given to the question of reduction of shock by the tool at starting and leaving the work; with this object in view, new methods of control enable the table speed to vary through electric drive. The gap between the rapid tool traverse movement and the actual cutting rate has been reduced in some cases to 1/50-inch on small work. Belts for driving feeds are being supplanted by gears, which removes loss of driving power by slipping. Improvements in holding the work and the tool have been achieved. Multispindle drilling and multiple cutting tools are widely adopted for repetition work. Many machines are more massive in design and control is easier. Electricity, hydraulic and pneumatic power are being adopted.

Safety regulations have become more stringent in recent years, and designers have endeavored to guard moving parts while maintaining easy access for inspection and maintenance. In many cases guards are designed so that the machine cannot operate until they are in place. Controls tend to be so placed that immediate stoppage is possible in emergency. It is in those directions that the design of machine tools gradually is improving concurrently with the increasing complication of machines.

In addition to a complete range of machine tools there were displayed compressors, furnaces, electric controls, ball and roller bearings, electric welding plant, chain drives, belts, lifting apparatus, power hammers and presses, testing machines, high-speed tools and special steels. A considerable number of machines that were exhibited in 1924 were shown this year, having received many improvements. In the following survey is given a brief description of those machines and improvements which have not been exhibited before.

William Asquith (1920), Ltd., Halifax, showed a 6-foot and 7-foot radial drilling machine, specially designed.

B. S. A. Tools, Ltd., Sparkbrook, Birmingham, displayed a wide range of centerless grinding machines, 4-spindle automatic machines, turning and screwing machines, automatic capstan lathes, form-turning and facing lathes, and small tools. Burton, Griffiths & Co. Ltd., London, displayed a number of American machines including a new duplex milling machine, a Gisholt Machine Co.'s new combination turret lathe, a LeBlond Machine Tool Co.'s new automatic multicut lathe, and a number of smaller machines. Webster & Bennett, Ltd., Coventry, exhibited for the first time a 36-inch and a 48-inch duplex boring and turning mill, high power type, which had been developed primarily for work where it is possible to make full use of maximum speeds combined with coarse feeds.

Crossley & Co., Manchester, showed milling machines of Swiss manufacture, and a high-speed gear-generating machine, for small gear production.

A Butterworth & Co., Rochdale,

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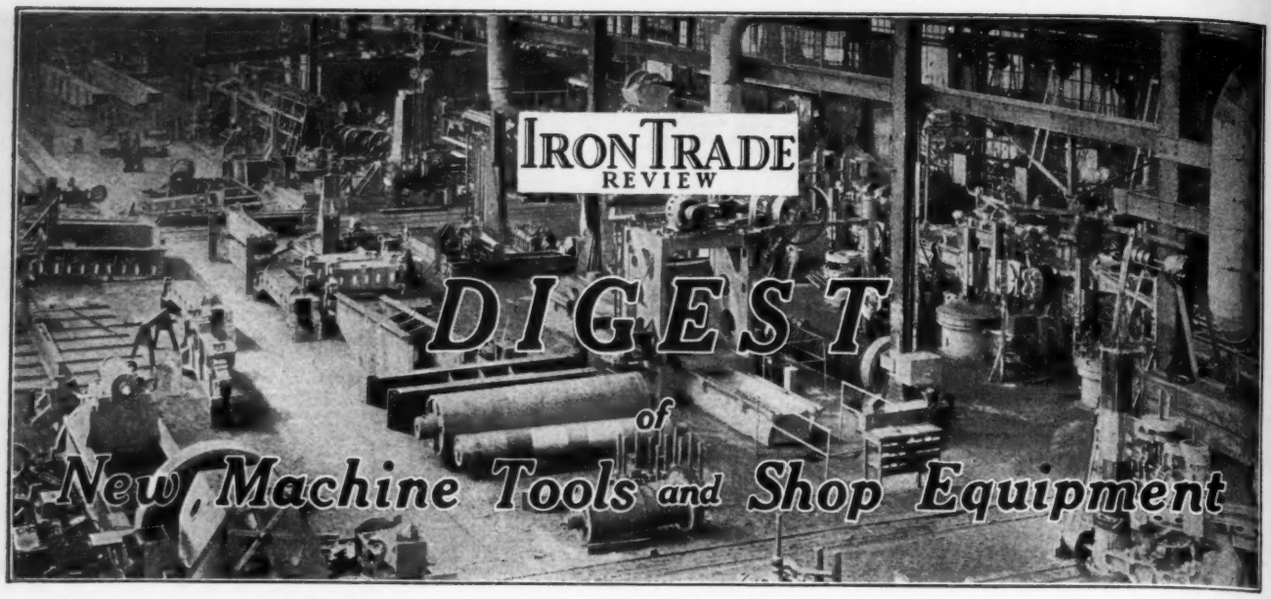
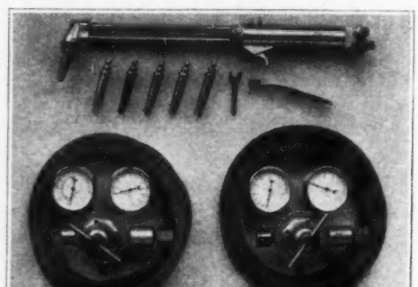


Designs General Purpose Cutting Torch

No. 243

Air Reduction Sales Co., 342 Madison avenue, New York, recently has developed a new cutting torch with improved high-pressure valve construction, interchangeable trigger or lever control and replaceable valve seat. The torch is said to be suitable for cutting steel of thicknesses from ¼-inch, or less, up to the heaviest sections within the skill of the operator. The device is fitted with standard hose connections and is furnished with either 75-degree or 90-degree angle head. The high and low-pressure oxygen tubes and the acetylene tube, all of seamless brass, are silver-soldered to the head and rear end of the torch. Interchangeable tips for acetylene, hydrogen, natural gas or other fuel gases are available. The cutting torch is furnished singly or, as shown in the accompanying illustration, in an outfit comprising the torch with trigger and lever cutting jet control, tips, oxygen and acetylene regulators and other incidental equipment. Weight of torch with tip is 3½ pounds.



No. 243—Cutting torch outfit

Speed Is Feature of New Tractor-Type Welder

No. 244

Lincoln Electric Co., Coit road and Kirby avenue, Cleveland, recently has placed on the market an automatic tractor-type arc welder to be used for making lap welds and butt welds on large tank bottoms, roofs, large pipe and similar work. The machine, as shown in the accompanying illustration, consists of a welding head mounted on a self-propelled four wheel-drive carriage. Power is supplied through a flexible cable. After the machine is lined up over the seam to be welded and the arc started, the electrode and fibrous autogenizer are fed automatically as the tractor travels forward. In making lap welds with this machine, no additional filler metal is used but when a butt weld is desired, a filler strip is laid over

Iron Trade Review's Calendar of New Equipment

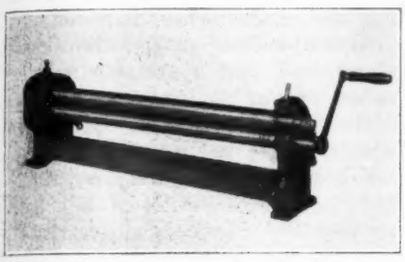
No.	Item	Builder	Comment	Date Described
220.	Electrode holder	Fusion Welding Corp.	Minimizes arcing and overheating	Aug. 30
221.	Pneumatic riveter	Hanna Engineering Works	Exerts 1-ton pressure; weighs 15 pounds	Aug. 30
222.	Steam valves	Jenkins Bros.	250-pound working pressures	Sept. 6
223.	Roll lathe	Mackintosh-Hemphill Co.	Equipped with roller bearings	Sept. 6
224.	Hydraulic punch	Hydraulic Tool Works	Light weight; hand operated	Sept. 6
225.	Milling machine	Brown & Sharpe Mfg. Co.	Vertical-spindle type; belt or direct-motor drive	Sept. 6
226.	Riveting hammer	Ingersoll-Rand Co.	Made in four sizes with two types of handles	Sept. 6
227.	Sand digger	Clark Tructractor Co.	9-foot bucket mounted on gasoline tractor	Sept. 6
228.	Arc welder	Lincoln Electric Co.	For welding heads of tanks	Sept. 6
229.	Floodlight	Prest-O-Lite Co. Inc.	For attaching to acetylene tanks	Sept. 6
230.	Metal punch	Whitney Metal Tool Co.	Two sizes; deep-throat design	Sept. 6
231.	Air hoist	Chicago Pneumatic Tool Co.	Increased speed; four-cylinder air motor	Sept. 6
232.	Sandblast helmet	Pangborn Corp.	Ventilation controlled by operator	Sept. 6
233.	Milling head	Fratt & Whitney Co.	Internal milling attachment for thread miller	Sept. 13
234.	Arc welder	Fusion Welding Corp.	Portable; driven by gasoline motor	Sept. 13
235.	Magnetic contactor	Cutler-Hammer Mfg. Co.	Automatic control for lighting and power circuits	Sept. 13
236.	Blowers	P. H. & F. M. Roots Co.	Roller and ball bearings incorporated on all models	Sept. 13
237.	Regulating rheostat	Cutler-Hammer Mfg. Co.	Speed control for fractional-horsepower motors	Sept. 13
238.	Electric motor	General Electric Co.	Single phase repulsion induction type	Sept. 20
239.	Molding machines	Osborn Mfg. Co.	Portable types for medium size molds	Sept. 20
240.	Semisteel pulley	W. A. Jones Foundry & Machine Co.	High wearing qualities; suited for jerky load	Sept. 20
241.	Open-side planer	Cleveland Planer Co.	48-inch type designed to do work of 60-inch machines	Sept. 20
242.	Acetylene generator	Oxweld Acetylene Co.	Three sizes; 50, 100 and 300-pound carbide capacities	Sept. 20
243.	Cutting torch	Air Reduction Sales Co.	Improved high-pressure valve construction	Sept. 27
244.	Arc welder	Lincoln Electric Co.	Tractor-type; for lap or butt welding	Sept. 27
245.	Slip roll former	Niagara Machine & Tool Works	Will handle 22-gage metal	Sept. 27
246.	Coupling	T. L. Smith Co.	Full-floating flexible type for driveshafts	Sept. 27

the seam to be welded. The chief advantages claimed for the machine are the high welding speeds and smooth, uniform welds. Speeds on ¼-inch lap joints vary from 50 to 75 feet per hour.

New Design Employed in Slip Roll Former

No. 245

Niagara Machine & Tool Works, 637-697 Northland avenue, Buffalo, has placed on the market a slip roll former of new design, a departure from the old, split bearing, top roll lifting type. A special gear arrangement permits setting the front rolls apart sufficiently to allow folded edges of sheets to pass through. Upon completion of the forming operation, a trigger release is pulled and the top roll swung forward. As shown in the accompanying illustration, the trigger release and the knurled roll



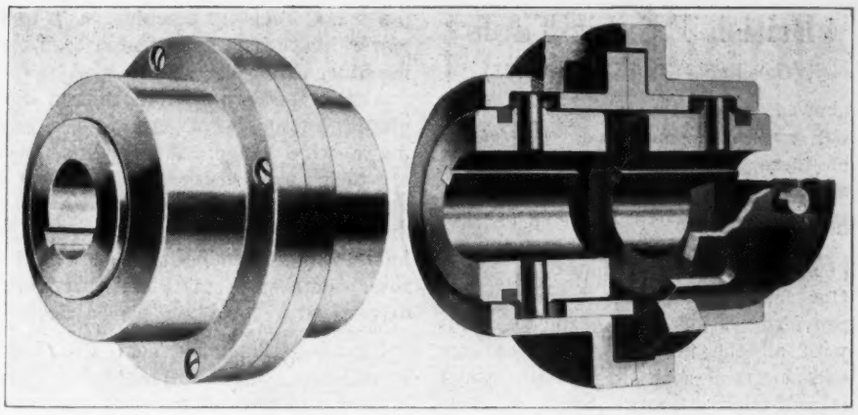
No. 245—Slip roll former

handle are on the same end of the machine, directly adjacent to each other, permitting the release and pulling forward of the roll to be performed almost simultaneously. The gears are of steel, machine cut and completely enclosed. This slip roll former will handle No. 22 gage metal and is available in three sizes.

Announces Full-Floating Flexible Coupling

No. 246

T. L. Smith Co., 1054 Thirty-second street, Milwaukee, has designed a new type of flexible coupling for use on driveshafts. The coupling is full floating and is claimed by the manufacturer to compensate for all possible conditions existing in a direct drive, such as angular misalignment of shafts, offset between shafts, endplay of shafts and shock. The accompanying illustration shows two views of the coupling one of which is a phantom view detailing the interior arrangement. Torsional load is transmitted through one or more ring-shaped springs made of alloy steel. It is said that these springs are not subjected to any wear from endwise motion of the shafts nor from angular or offset misalignment since they are confined in a housing eliminating all motion except opening and closing under stress.



No. 246 (Left)—Full-floating flexible coupling. (Right)—Phantom view of the coupling

Foundry Equipment Body Holds Meeting

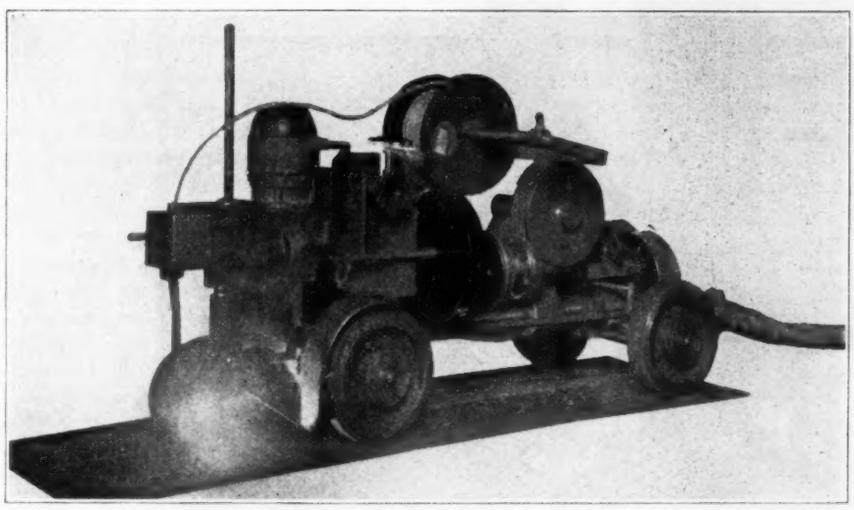
The meeting of the Foundry Equipment Manufacturers association, held at the Hotel Cleveland, Cleveland, Sept. 18, was well attended. After reports by the members present on business conditions in the industry, a number of addresses were made. J. T. Keenan, treasury department, Washington, spoke on "Depreciation and Obsolescence of Shop Equipment from the Income Tax Standpoint," and A. E. Grover, cost consultant, National Machine Tool Builders association, Berea, O., talked on "Accounting for Depreciation and Obsolescence of Shop Equipment." After luncheon Glenn H. Hoppin, vice president, Stout Air Services Inc., spoke on "How Foundry Equipment Manufacturers Can Use Airplane Service to Increase Sales." Walter Seelbach, president of the Gray Iron institute, explained the work of that group and Arthur J. Tuscany, secretary of the institute, told how the foundry equipment manufacturers might co-operate with the institute to merchandise the foundry industry.

August Coke Output Up

August production of coke in the United States totaled 4,282,924 net tons, of which 3,994,924 tons was by-product and 218,000 tons beehive, according to the United States bureau of mines. July output of coke was 4,182,082 tons and in August, 1927, 4,166,410 tons.

In the first eight months of 1928 output of by-product coke was 31,577,542 tons and of beehive 2,829,000 tons or a total of 34,406,542 tons. In the opening eight months of 1927 production of by-product coke was 24,451,191 tons and of beehive coke 5,372,000 tons or a total of 34,823,191 tons.

The international commission on illumination meets at Saranac Lake, New York, Sept. 22-28. Approximately 100 lighting engineers representing the United States and 12 other countries are expected to attend.



No. 244—Automatic tractor-type arc welder

British Exhibit Tools

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showed automatic turret lathes and bar automatic machines. A feature of these machines is the double-arm support, which ensures all tools in the turret being piloted full length.

Ward, Haggas & Smith, Keighley, displayed a range of improved lathes. One feature is that a force pump is provided inside the head to spray with oil the gears and all bearings, except from neck to spindle, which is self-oiled. George Swift & Sons, Ltd., Halifax, exhibited their improved radial drilling machines, a 15-inch center motor-driven all-geared head lathe, a 14 to 16-inch stroke traversing head shaping machine, a 4-foot power elevating arm radial drilling machine, and others.

Alfred Herbert, Ltd., Coventry, displayed a number of machines covering a wide range. Among machines of their own manufacture were a number which had not hitherto been displayed. Charles Taylor (Birmingham), Ltd., Birmingham, showed its rotary cutting-off machine, electrically driven, with lever or power feed.

Churchill Machine Tool Co. Ltd., Broadheath, near Manchester, exhibited a number of grinding machines of its own manufacture. Charles Churchill & Co. Ltd., London, displayed a considerable number of American machine tools. A number of these were exhibited for the first time.

Among the machines shown by the Butler Machine Tool Co. Ltd., Halifax, was an 8-inch stroke tilting-body slotter. A tilting body enables tapers up to 11 degrees to be slotted in either direction.

An interesting machine exhibited by John Lang & Sons, Ltd., Johnstone, near Glasgow, was their automatic tooth-rounding machine for rounding the teeth of sliding gears. This machine is particularly adapted for the gears of automobile gear boxes and self-starter rings. The same firm Coventry, Ltd., Manchester, exhibited a patent spiral bevel gear planer. A Britannia Lathe & Oil Engine Co. Ltd., Colchester, showed a new standard 4-inch lathe, driven electrically.

A feature of the exhibit of W. H. Kearnes & Co. Ltd., Broadheath, near Manchester, was a double-head axle box boring and facing machine, fitted with a snout boring tool and provided with facing chucks capable of facing up to 24 inches diameter.

Kendall & Gent (1920), Ltd., Gorton, Manchester, had a portable universal radial drilling and tapping machine, in the form of a bogie mounted on wheels, which are adjustable. Dean, Smith & Grace, Ltd., Keighley, showed a 71-inch center toolroom lathe with an electrical control gear carried inside the foot on hinged panels. James Archdale & Co. Ltd., Birmingham, displayed a comprehensive range of drilling and milling machines. John Stirk & Sons, Ltd., Halifax, exhibited their patent openside hiloplane, 72 inches x 16-foot planer, and their 60 x 60-inch double standard hiloplane. H. W. Ward & Co. Ltd., Birmingham, showed a number of new capstan and turret lathes, and a broaching machine, 50-inch stroke, with four speeds, capable of broaching holes 3 inches square from the round, with single pulley drive.

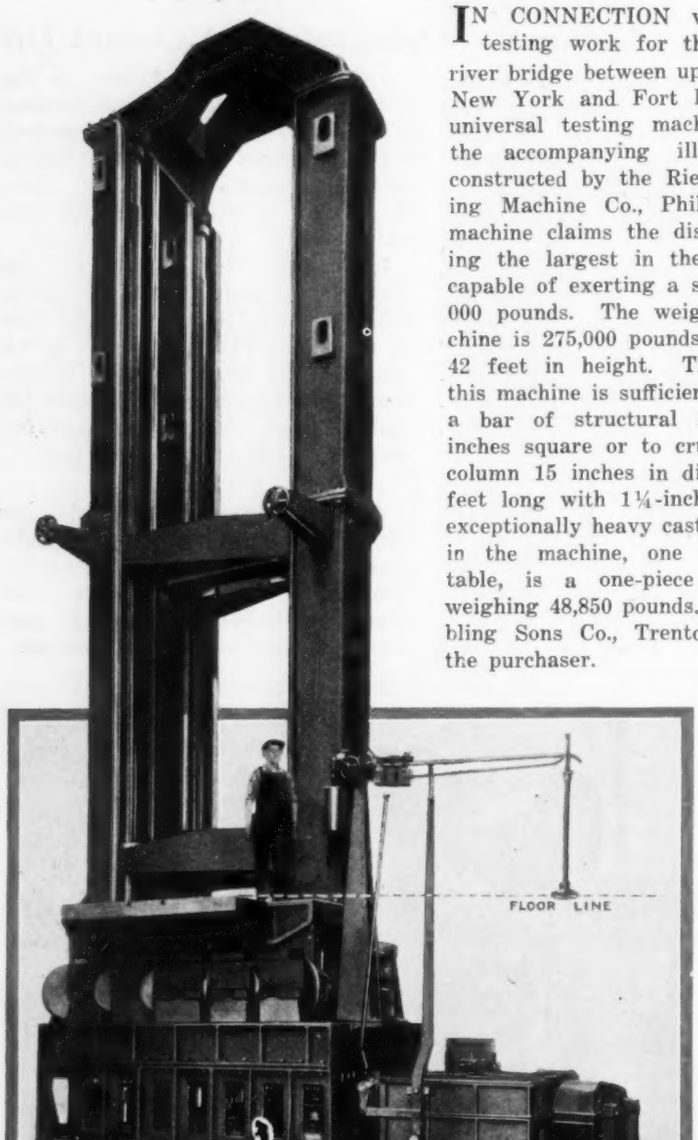
J. Parkinson & Sons, Shipley, exhibited, among the newest types, a plain milling machine with single-pulley drive. There are 16 spindle speeds and 16 rates of feed with quick power traverse in all directions.

Buck & Hickman, Ltd., Whitechapel Road, London, displayed a number of American machines. Craven Bros. (Manchester), Ltd., Reddish, Stockport, showed a motor car axle turning lathe of the central-drive type.

Sawing machines were exhibited by Edward G. Herbert, Ltd., Manchester, who displayed a new line which has been put on the market recently.

World's Largest Universal Machine Built for Testing Bridge Cables

IN CONNECTION with the cable testing work for the new Hudson river bridge between upper Manhattan, New York and Fort Lee, N. J., the universal testing machine, shown in the accompanying illustration, was constructed by the Riehle Bros. Testing Machine Co., Philadelphia. The machine claims the distinction of being the largest in the world and is capable of exerting a stress of 2,000,000 pounds. The weight of the machine is 275,000 pounds and it is over 42 feet in height. The capacity of this machine is sufficient to pull apart a bar of structural steel nearly 6 inches square or to crush a cast-iron column 15 inches in diameter and 15 feet long with 1¼-inch walls. Some exceptionally heavy castings were used in the machine, one of which, the table, is a one-piece steel casting weighing 48,850 pounds. John A. Roebling Sons Co., Trenton, N. J., was the purchaser.



Alabama in 1927 produced 3,474,000 pounds of crystalline graphite, two-thirds of the total for the United States.

Stocking of Steel Found Negligible

Survey of Consumers at Pittsburgh, Chicago and Cleveland Indicates Recent Heavy Specifying Prompted by Definite Consumptive Requirements

RECORD production of steel in July and August, and probably also in September, has its basis in genuine consumption requirements, a canvass by representatives of IRON TRADE REVIEW in the Pittsburgh, Chicago and Cleveland districts reveals.

On the whole, consumers' stocks are scarcely above normal, accepting the last three or four years as normal. Where stocks have tended to expand recently the cause generally has been a sharp increase in consumption. In fact, stocks in the past ninety days do not seem to have grown as rapidly as the consumption of steel, and on this basis appear subnormal.

Higher prices in prospect for the fourth quarter appear of little moment. A rise of $2 per ton or so does not neutralize the economy of a flow of raw material delicately attuned to daily needs. Then, too, inventory taking is scarcely 90 days distant.

The more important consumers of steel do not reckon politics a factor. There is no fear that mill deliveries will become sufficiently deferred to inconvenience users.

Economy of Moderate Inventories Breeds Caution

PITTSBURGH, Sept. 25.—Little tendency is shown by consumers of iron and steel products to deviate from the practice of buying material only as needed, regardless of the fact that higher prices will rule on a number of products during the fourth quarter. As a result, stocks on Oct. 1 will vary but slightly from the tonnage carried several months previous, except in some instances where an increase in business booked necessitates the consumption of a larger volume of raw material within a short space of time and requires better stock protection.

The most common reason heard for adhering to the hand-to-mouth buying principle was expressed by a manufacturer of metal stampings. "We have attempted to keep our supply of raw material at a minimum and do not believe that the saving to be made in buying recently warrants the additional expense of carrying a larger stock," this company states. It has specified more heavily during the past few weeks, owing to the fact its business has increased proportionately, but its supply of steel on Oct. 1 is expected to show little if any increase over the level two months previous. A similar view was given by another maker of metal stampings and metal products.

No anticipation of steel requirements is reported by a manufacturer of sheet mill products and general heavy mill supplies.

Two representative reinforcing bar sellers stated that they had ordered ahead on material for which they had definite commitments but that their stocks of concrete bars on Oct. 1 would not have been expanded by buying in anticipation of future requirements. A fabricator of plates and shapes declared that it regulated its buying of plain material by the volume of business on its books and that since it was difficult to predict the trend of future awards, it has not made an attempt to buy against future needs.

A warehouse interest here declared its volume of business has been more active recently and it has increased its mill purchases, but that the level of its stocks on Oct. 1 will not have appreciated greatly compared with preceding months.

Some contracting for pig iron and steel scrap was done a short time ago to take advantage of prevailing low prices, according to a machinery manufacturer, but it has not followed a similar procedure on finished steel.

All buyers stated that their practice in buying ahead has not been altered during the past year and that stocks on Oct. 1, if they show an increase over the level 12 months ago, will have been expanded only to meet the requirements of more active business.

* * *

CHICAGO, Sept. 25.—A canvass of finished steel users in the Chicago district, including large and small miscellaneous metalworking plants, iron and steel warehouses, reinforcing bar and structural fabricating shops, and cold bar finishers, discloses the fact that building of finished steel stocks against the announced advance in fourth quarter prices is negligible. In nearly all cases consumers are carrying what has become to be regarded as normal requirements in view of reasonably prompt deliveries.

Because mills are permitting more of their customers to order out material on third quarter obligations up to Oct. 1, instead of holding closely to the limit of Sept. 10, the situation has changed somewhat. Some views are that if the Sept. 10 closing date on third quarter specifications had not been partially waived, a tendency might have developed for the building up of steel stocks in several lines.

The $2 advance for fourth quarter does not appear sufficiently formidable to most consumers to justify them in taking in finished steel stocks in excess of indicated early requirements. Specifications, nevertheless, are heavy on third quarter contracts, but in general steel consumers are seeking to cover for prospective work now in sight over the next 30 to 60 days. The change in the cash discount on strip steel and sheets from 2 per cent to one-half of 1 per cent is regarded as being virtually an increase in these lines, but in the face of the $2 advance in bars, plates and shapes and the inauguration of the new cash discount, consumers are giving little concern to creating larger stocks of their steel supplies.

Structural fabricating shops are carrying their usual stock sizes of beams, channels, angles and plates, amounting roughly to 60 days' supplies, and are buying in addition only plain structural material for work at hand or definite building and bridge projects to be placed. On Oct. 1, despite the heavy general specifications in recent weeks, most fabricators will have little in excess of usual stock requirements.

Reinforcing bar fabricators, particularly billet bar shops, have made practically no start on fourth quarter contracting. In general they do not plan to carry more than the usual 30 to 60 days' supplies. In the remaining days of this month, it is indicated reinforcing bar fabricators will negotiate activity for fourth quarter.

Steel warehouses report they are carrying heavy stocks because of active consumption and buying from ware-

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Editorials

Glorifying The Service of Metals

EXAMINATION of books recently offered to business men reveal the fact that a surprisingly large number of authors are attempting to explain the present industrial situation in the United States. Many of them have hit on the term "American prosperity," or variations of it, to describe the gratifying condition of expanding purchasing power, volume production and high standards of living which prevail in this country.

Almost without exception these authors, who are keen students of economics, attribute American success to the mechanization of industry. The liberal substitution of power, machines and good management for manual labor, in their opinion, is responsible for the favorable economic status.

No one can find fault with this analysis, but it is surprising that in practically all of the detailed and exhausting studies that have been made, little if anything has been said of the developments in iron, steel and nonferrous metals which have served as the basis of advances in mechanization. It is certain that without the service of metals in their present highly developed state much of the progress that has been made in mass production of automobiles, household equipment and other articles would have been impossible.

During the week of Oct. 8 thousands of the great army of technicians who have contributed to this "American prosperity" through their service in metals will have an opportunity at Philadelphia to demonstrate their achievements. In technical papers presented as part of the programs of three national technical organizations they will discuss the latest developments in the production, treatment, fabrication and use of steel and nonferrous metals. In an elaborate exposition, the practical application of their work will be shown.

Co-operation of the American Society for Steel Treating, American Welding society and Institute of Metals division of the American Institute of Mining and Metallurgical Engineers in these activities is most appropriate. The members of these groups have many common interests and their roles in industry are similar. All are engaged in adapting iron, steel and nonferrous metals to the exacting requirements of current mechanical development.

The 1928 conventions with the show, which is appropriately termed the "National Metal Exposition," deserve the attention and should attract the participation of every individual identified with the utilization of metals. The past record of the American Society for Steel Treating, which in a short span of years has elevated the service of steel to a position comparable to that enjoyed by the work of many older organizations, is sufficient in itself to promise marked success for the 1928 event. The American Welding society, through its activity in promoting the interests of welding, has contributed much to the march of industry. The Institute of Metals—oldest of the three groups—has been a consistent force in the improvement of nonferrous metallurgy.

Industrial executives and others who are fortunate enough to attend the Philadelphia conventions and exhibition cannot fail to gain a new conception of the roles of metallurgy and fabrication in American economic development. They will hear and witness evidence of activities that are even more significant to the country's welfare than the much heralded mechanization of industry."

Car Builders Turning the Corner

FOREST conservation, expansion of iron and steel production, larger use of steel in the railroad industry than has been possible in recent years, employment of more men in the steel industry—these things and more are involved in the ban upon the use of all-wood freight cars after Jan. 1, 1931, proposed by the American Railway asociation.

This undoubtedly means the replacement at most of the 300,000 wooden freight cars now extant. In recent years many railroads have automatically anticipated this program in that as their obsolete car equipment has had to be replaced, steel cars have been ordered. This has furnished much tonnage to the sheet, plate and bar mills, the axle, wheel and journal box manufacturers as well as to collateral industries. To this trend, too, can be traced the greater transportation and delivery efficiency of the railroads which has attracted such favorable comment, even in the wintry months which formerly were the proverbial times for transportation tieups. An all-steel box car unit stands greater abuse with less time out for repairs, travels a greater per ton mileage and carries more tonnage than an all-

wood box car possibly could be expected to. Should these 300,000 condemned freight cars be replaced over a period of five years beginning 1930 and an average of 25 tons of steel be used per car, the steel industry would benefit 1,500,000 tons per year. In addition there would be the normal replacements and additions, which have been averaging a little over 60,000 per year. It is not improbable that the car building industry has behind it the leanest years of this decade.

Banner Implement Year in Sight

ACTIVITY of farm implement manufacturers, particularly in western territory, has been a notable factor in sustaining finished steel operations the past two years. Thanks to an unusual fortuitous combination of good crop conditions and a rising market for farm products, the financial position of the farmer and his buying power have begun to point definitely upward. Manufacturers of farm machinery have succeeded in working their way out of a state of mere recovery from the deflation period of 1920-21 to a condition of prosperity. All indications are that 1928 will be the banner year for the implement industry since the World war.

This year tractor divisions of implement works have kept up a remarkable rate of activity, and no sign of decline is discernible. The farm tractor has been going through an evolution to an implement of lighter weight material without the sacrifice of durability and sturdiness. Consequently, more alloy and special analysis steels are being used in their manufacture. With the improvements have come increased sales. Farm implement engineers are constantly developing improvements in equipment design and service. This bespeaks an ever growing market for implements, particularly in view of the fact that farm standards of living are measuring definite advances.

Scholarships Pay Human Dividends

INVESTMENT of money for the sake of monetary returns is a practice old and time honored among iron and steel as well as machinery men. Industrial concerns in New England, however, are investing their money in a different way from that usually followed—a way from which they hope to draw human dividends. In co-operation with the Worcester Polytechnic institute, 14 representative New England industries such as machine tool or textile machinery builders, grinding machine, motor or paper manufacturers, and others offer 29 scholarships to students who show particular ambition, ability or aptitude. Some of these offer, one scholarship, others offer two. Three offer four and one, a grinding wheel manufacturer, offers six. They are offered annually to the sons and relatives of the employes of these 14 companies which are exceedingly careful in their selection of students because it is from their ranks that future executives for these same companies will doubtless be drawn.

Invariably New England industries favor graduates of the Worcester Polytechnic institute and plants throughout central Massachusetts are fairly well populated with its alumni. Heads of these industries are doing all in their power not only to encourage study but also to reward properly any latent ability which may thus be uncovered. New England is to be congratulated not alone on having such an institution as the Worcester Polytechnic but in possessing such a high-minded and far-seeing aggregation of executives as is represented in the group which has arranged thus to encourage its student body.

Steel Also Had Its Heyday

TO ILLUSTRATE an argument for curbing concentration of governmental functions at Washington and restoring the sovereign rights of states, Chairman Raskob of the Democratic national committee recently contrasted the General Motors Corp., whose finance committee he once directed, with the United States Steel Corp. General Motors, he contended, with its loose organization and one-fifth the capital of the highly-centralized United States Steel, earns twice as much.

A statistical purist would challenge this ratio. As shown in IRON TRADE REVIEW, issues of March 29 and April 5, 1928, General Motors last year with one-third United States Steel's capital earned three times as much. Even so, the comparison does no credit to the steel industry.

It is true, as Mr. Raskob infers, that General Motors is a loose organization. Officers of the subsidiaries are practically autonomous and, subject to good business practice, the test of their policies and programs is the amount of profit they turn into the General Motors treasury. Quite the opposite is the focusing of authority in United States Steel at 71 Broadway and the narrow limits within which the dispersed officials of subsidiaries can function. There is a body of opinion within the industry itself that a freer hand for corporation units would be of benefit.

But to credit General Motors' enviable earning power and to blame United States Steel's meager return to their respective forms of management is to disregard other, and probably more potent, factors. Steel is an old industry, compared with motors, and thirty to forty years

ago, at a state of development similar to that of motors today it, too, was making millionaires fast. Other basic industries, such as coal, lumber, agriculture and the railroads, now are also scanty earners.

Then, too, the automobile has a direct appeal to the consumer which steel inherently lacks. Its individual, effortless transportation frees one from many limitations and hence captures the imagination. The automobile is styled and made fashionable; a steel bar or plate is just that and no more. Discarding rolls as automobile manufacturers replace body and fender dies sounds fantastic. The financial loss a business man accepts in turning in last year's automobile because his family is enamored of a new body type is readily glossed over, but what would be said of the economic loss if half the structures in downtown New York and Chicago were razed and replaced because new Carnegie and Bethlehem beam sections are now available?

The day of the automobile will pass. It is inevitable in human progress that a more refined mode of transportation—perhaps the airplane—will come within popular purse reach, and then as real competition strides up automobile profits will narrow, such extravagance as yearly models will be curbed and in their efforts to insure even a modest return to their stockholders the subsidiaries of the General Motors of that day will be held in the same tight rein that steel executives are today.

Million Tons from Coal Dust

UTILIZATION of coal mine waste by briqueting is on the increase in spite of the rich fuel deposits of the United States. Coal too small to be burned by other means is compacted under pressure, with a binder to assist in holding it together and the resulting product is sold in competition with coal from mines.

Briqueting is carried to greater lengths in European countries where coal is less plentiful and Germany, France and Belgium lead, the former supplying nearly 80 per cent of the world's output of 50,000,000 metric tons. In the United States close to a million tons a year are produced.

Greatest growth in tonnage has come about in years when coal strikes have decreased mine production. However, resumption of mining has been followed by much of the gains made by briquets being maintained, followed by further increase in the face of ample mine supplies.

Manufacture of briquets appears to be best suited to large production units and many small plants have failed or gone out of business as the industry has developed. All grades of coal and oil-gas residue are employed in this process and it is a distinct bit of conservation, the million tons of briquets saving an equal tonnage of coal.

What Our Readers Are Thinking

Both Striving for Good Steel

To the Editor:

REFERRING to the article which appeared on page 514 of the Aug. 30, 1928, edition of IRON TRADE REVIEW, we attach hereto a copy of letter which we have addressed to Charles F. Abbott, executive director, American Institute of Steel Construction Inc., which is self-explanatory:

"Dear Sir: I have read with a great deal of interest your article regarding imported steel which was published in IRON TRADE REVIEW. I am sure that some of the statements therein were only the result of lack of information regarding imported steel and am taking the liberty of correcting the false impression which may be created thereby.

"You are probably unaware of the fact that the leading mills in Europe now roll all American standard beams 3 inches to 24 inches inclusive, channels 3 inches to 15 inches inclusive and angles up to 8 inches, so that there is obviously no necessity for American fabricators to buy imported steel having geometric proportions which vary in the slightest from the American product.

"It will also interest you to learn that most of the large European mills now roll structural steel for the American market in exact accordance with the requirements of the specifications for structural steel for buildings as adopted by the American Society for Testing Materials and your institute. Mr. Klienert's statement regarding the tensile strength of European steel only applies to steel rolled for consumption in the European home market and not to steel supplied to the American market in accordance with A. S. T. M. specifications.

"You are also apparently unaware of the fact that each and every piece of structural steel shipped to this market by leading European mills is marked with the heat number and a careful test made and recorded of each heat, and test sheets furnished the buyer upon request.

"In addition to this careful mill inspection, a detailed surface inspection, as well as tests of each heat, at the works may be obtained by agreement with the mill by placing an inspection order with Robert W. Hunt Co. or the Pittsburgh Testing Laboratories, both of whom maintain their own staff of inspection engineers at leading European steel producing centers.

"I quite agree with you that the present standard of American building construction should be maintained and to this end, and to avoid the possible losses mentioned in your article, it is to be recommended to members of your institute to observe the usual precautions when ordering either domestic or imported material."

L. B. PARKER, *vice president and manager, Amerlux Steel Corp.*

San Francisco, Sept. 4, 1928.

EDITOR'S NOTE: Careful examination of the article in the Aug. 30 issue of IRON TRADE REVIEW and comparison of its context with that of Mr. Parker's remarks show no disagreement. Both advocate the maintenance of high standards of steel for building construction.

IRON TRADE REVIEW

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E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*

Philadelphia Exposition Emphasizes Adaptability of Metals. Page 753.

THIS issue of IRON TRADE REVIEW features the arrangements for the National Metal Exposition, in Philadelphia, the week of Oct. 8. A great national institution is in the making; indeed, may be said to have been firmly established, with three important technical societies co-operating and sponsoring an exhibit showing the production, treatment, fabrication and use of steel and nonferrous metals, and in co-ordinating their efforts for further improvement in metallurgy. Readers will find in this issue full details regarding the exhibitions and programs and many articles appropriate to the occasion.

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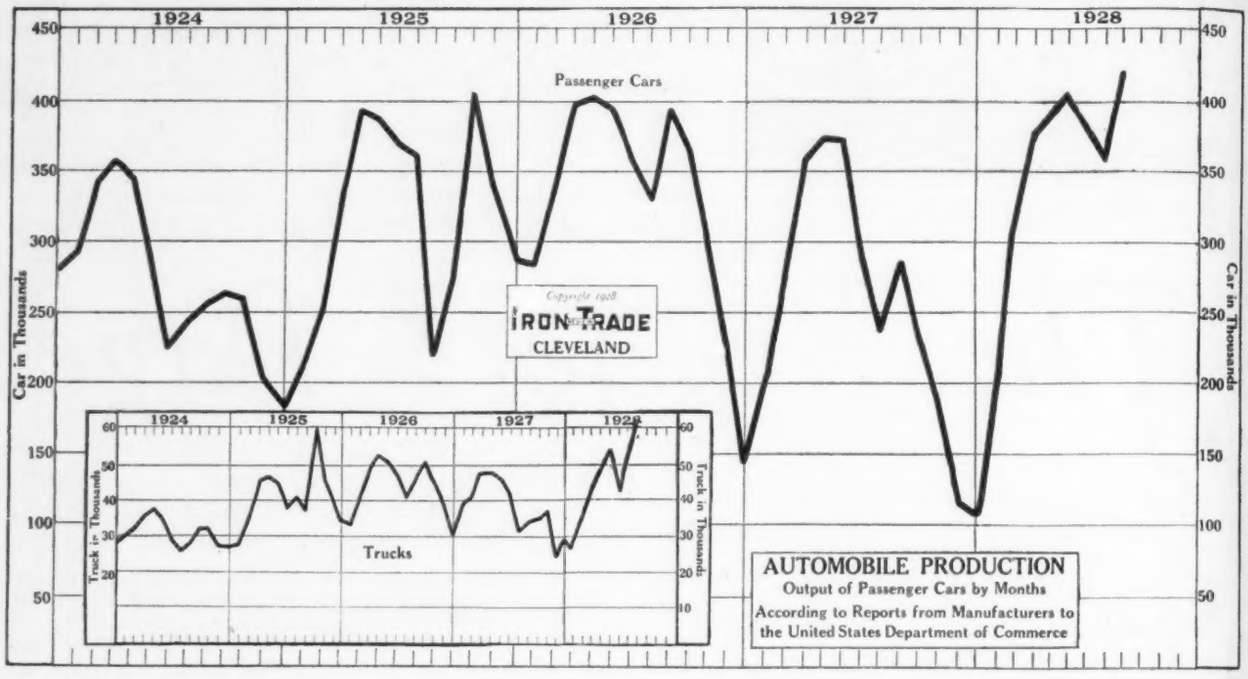
The Business Trend



Motor Car Output Record Breaking

By JOHN W. HILL, Financial Editor

MORE motor vehicles were produced in this country and in Canada in August than in any month in the history of the industry. This is a noteworthy fact in view of the rule that the peak of automobile output usually comes in the spring. The actual total for the month was 458,429 cars and trucks. This compared with 425,863 in May, the best previous month of the year.

COMPARED with August, 1927, when 308,826 cars and trucks were turned out, there is a gain of over 57 per cent. In August, 1926, the production was 426,606. The best previous month's output for the industry was in April, 1926, with a total of 441,306 cars. For the first eight months of 1928 production was 3,051,220 cars and trucks.

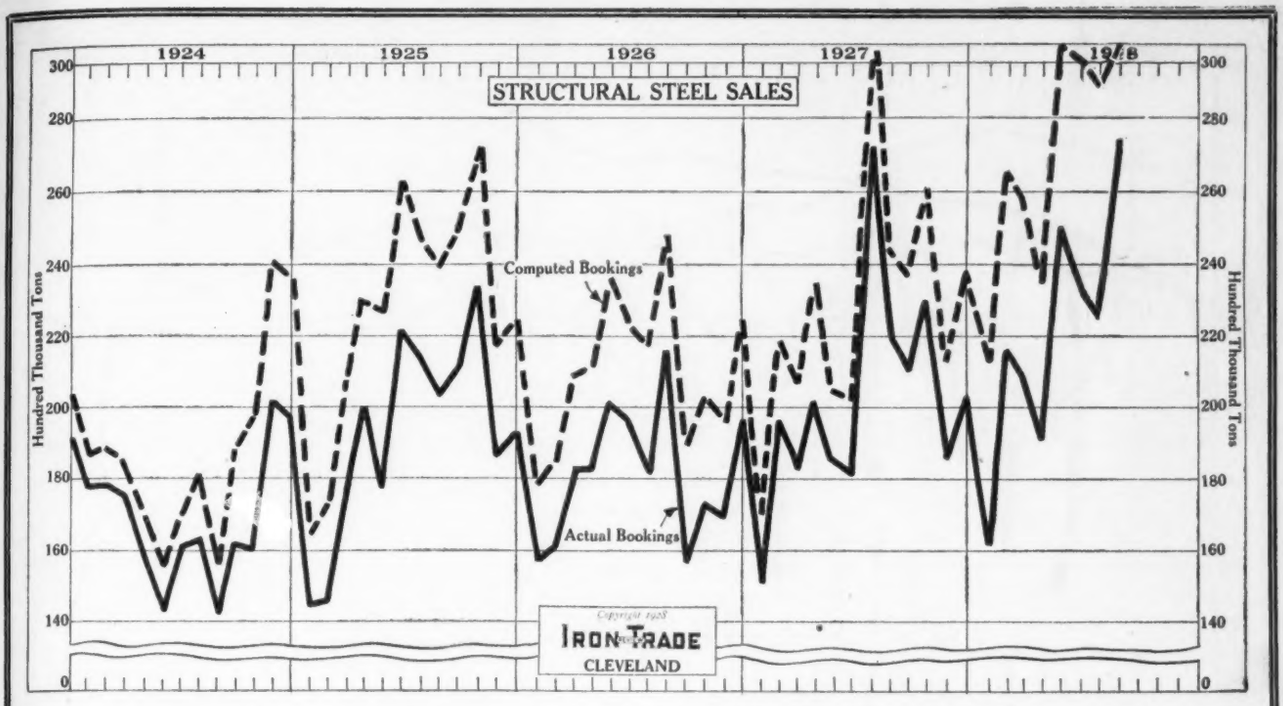
THIS compares with 2,646,285 in the corresponding period of 1927. That figure was exceeded this year by fully 16 per cent. There is every indication now that the full year's total will establish a new annual record. No signs have yet appeared of any slowing down in the tremendous stride of motor car production. in this country.

THERE is not likely to be any slackening until dealers' stocks of various popular makes have been brought up to normal. At the present time a number of producers are in arrears in deliveries and dealers' stocks are low. This fact makes it clearly evident that the rise in output so far has not been attended by unhealthy symptoms.

WHAT has brought the bulge in motor car demand at a time when tapering off is not unexpected? The improvement has coincided so closely with the betterment in the agricultural crop prospect that it is impossible not to believe in some correlation between the two. Early in the season crop prospects were only fair, in some cases, poor.

IT IS now evident that the season's output of corn, wheat, potatoes, many kinds of fruit and various other products will be large and in some instances record-breaking. Moreover, livestock prices are high. While prices of a few crops, including wheat and potatoes, are below last year, the aggregate farm return this year may exceed 1927 by 8 per cent. That this is being reflected in stimulated trade is undoubted.

The Business Trend

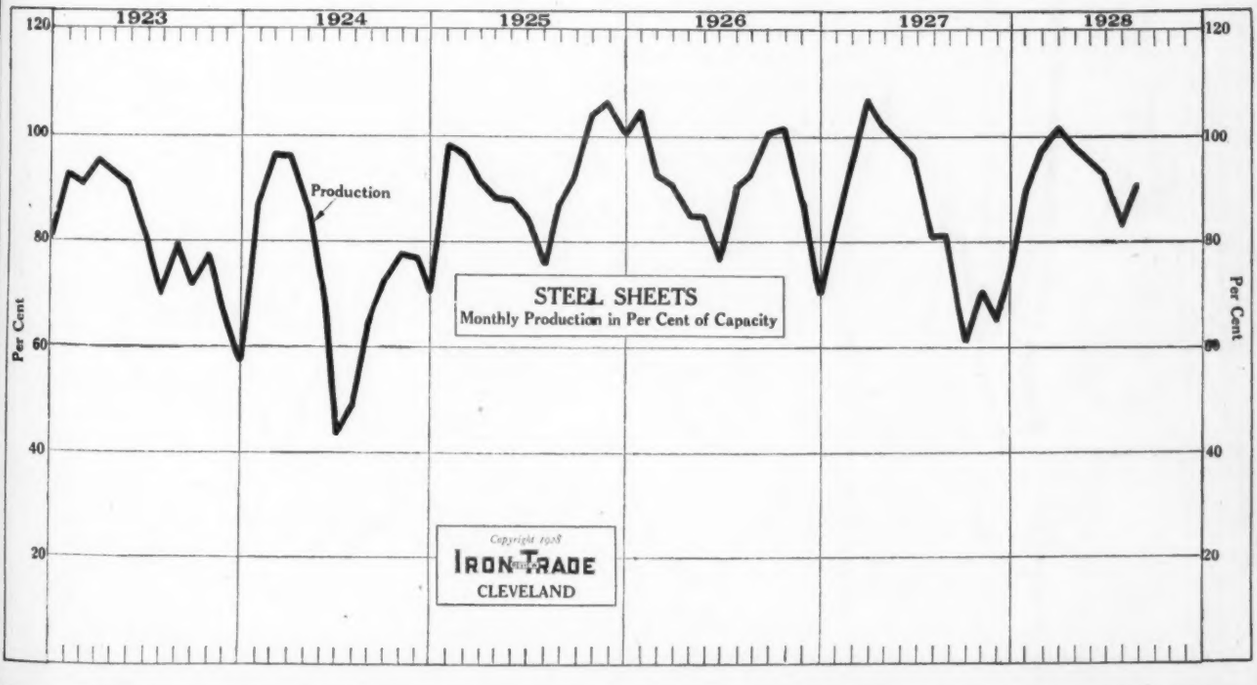


Structural Awards

NOTWITHSTANDING the advance of money rates and the predicted adverse effect they would have upon building construction, the general tone of the structural steel market is strong, with new contracts moving at uniformly high levels. During August the actual tonnage of fabricating shops was 274,000 tons against 238,000 tons one month before. Computed tonnage was 356,000 tons against 296,000 tons in July. The August total was the highest of any month on record.

Steel Sheets

THE marked rise of production for the automobile industry has resulted in a large gain in the output of sheets. During August production reported by members of the National Association of Flat Rolled Steel Manufacturers was 329,396 tons or 92.2 per cent of capacity compared with 267,585 tons, or 82 per cent of capacity in July. The rate of output for the month was the highest since May. Shipments gained sharply also and apparently there has been no letup in demand from the motor car trade.



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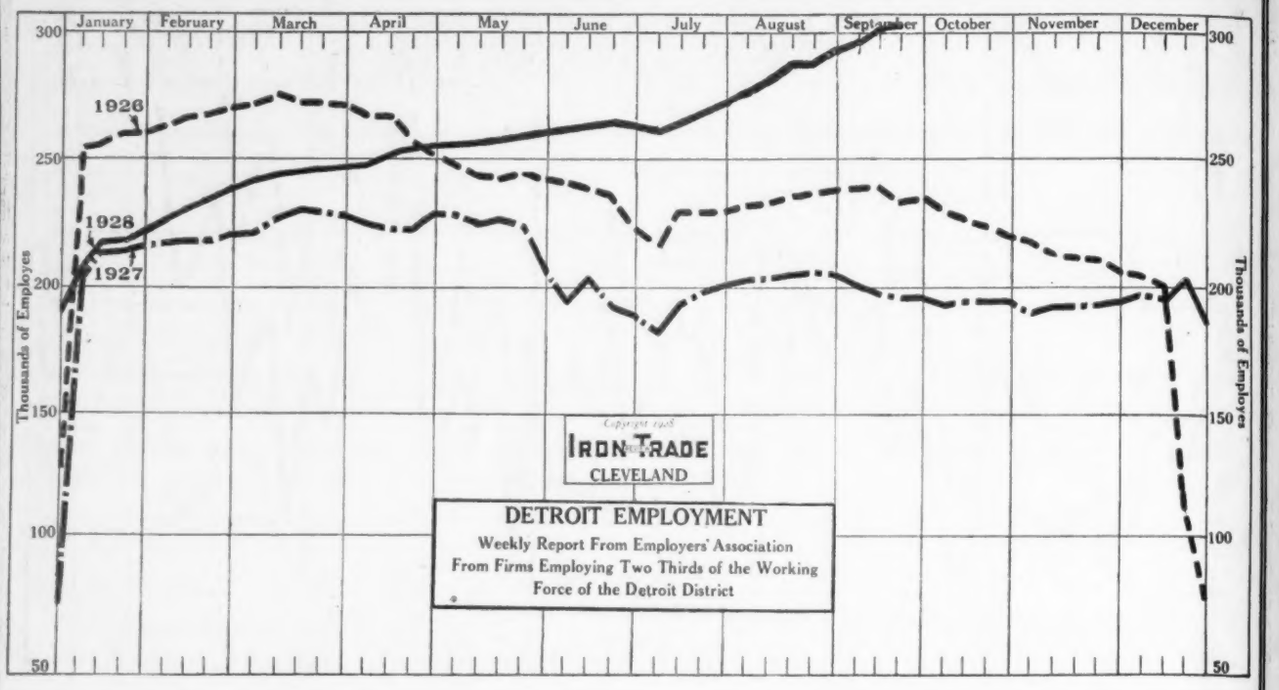
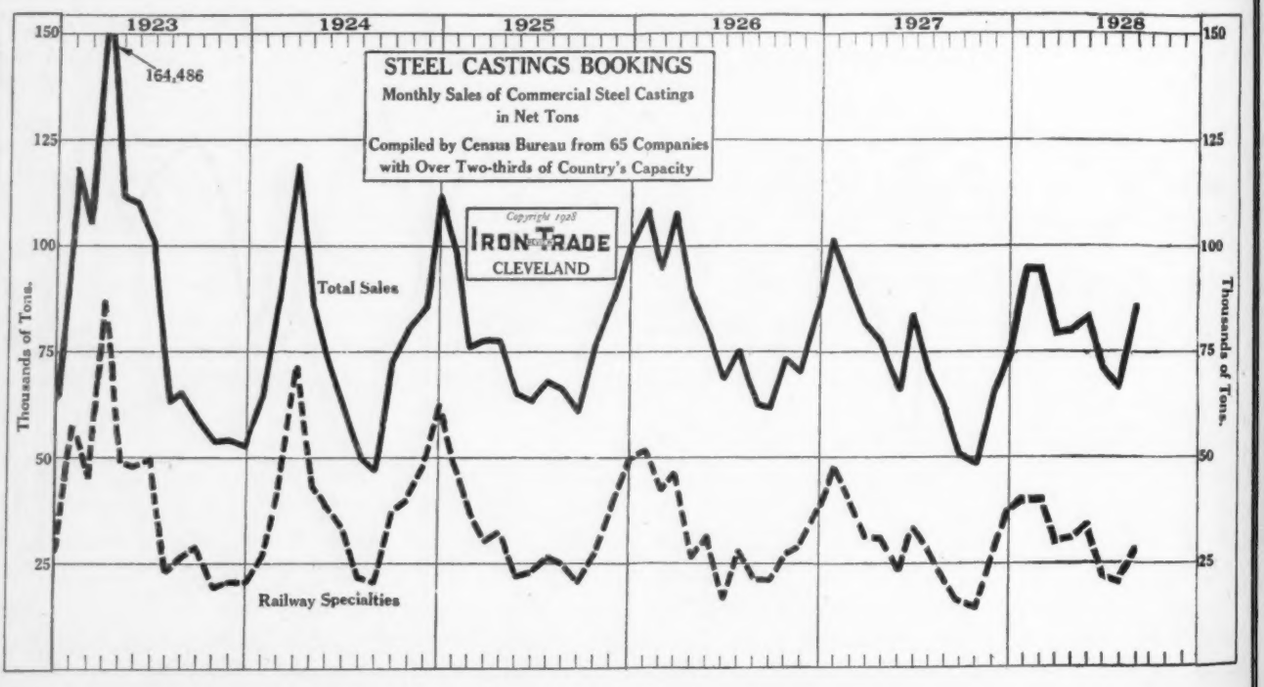


Detroit Employment

EMPLOYMENT in the Detroit manufacturing districts continues to increase. The total for the week ended Sept. 18 was 300,759 as reported by the Detroit Employers' association. This was an increase of 415 over the preceding week. Compared with the corresponding week of one year ago there was a gain of 103,925. Employment in the automobile producing center is now at the highest level of any time on record. The great improvement in the demand for cars is partly due to farm buying.

Steel Castings

IMPORTANT gains in steel castings bookings took place in August, reflecting the general improvement of industrial activities, and particularly the automobile industry. Total bookings of commercial steel castings in August amounted to 86,000 tons compared with 78,000 tons one month before. Railway speciality shops did not share in the improvement. In fact bookings of this class declined to 27,100 tons from 27,500 tons one month before. Miscellaneous bookings made an important gain.



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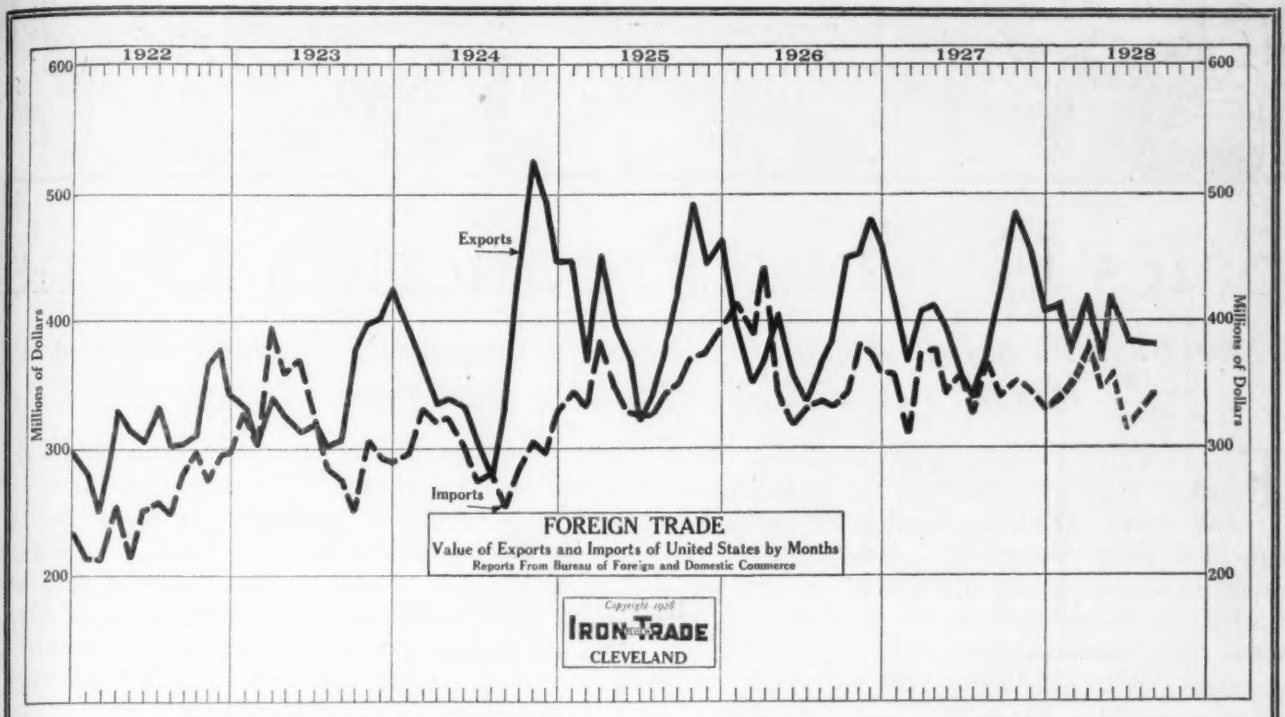
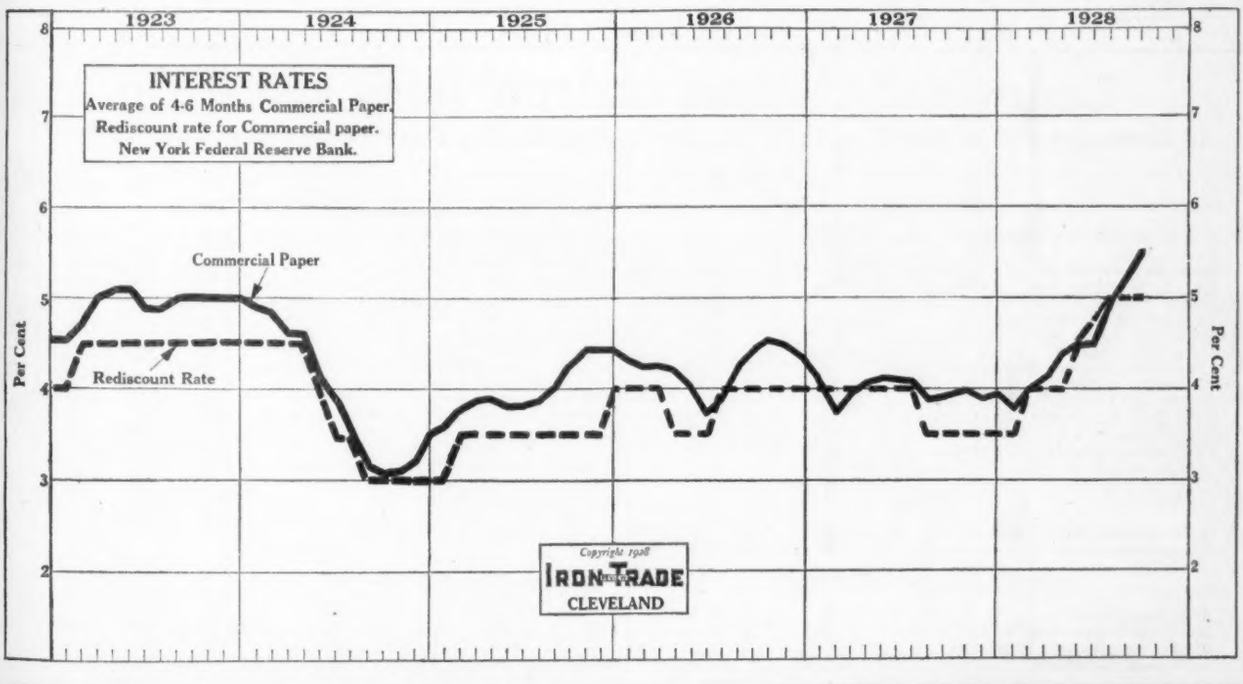


Foreign Trade

EXPORTS of American merchandise in August stood at $381,000,000 compared with $382,000,000 in July and with $375,000,000 in August, 1927. Imports were $347,000,000 against $316,000,000 one month before and $347,000,000 one year before. For eight months exports were $3,136,941,000 compared with $3,083,509,000 for the corresponding period of 1927. Imports were $2,750,669,000 compared with $2,811,544,000 in the like period of last year. The excess of exports this year was $386,000,000.

Interest Rates

MONEY rates have advanced to the highest level since 1920. Time money at New York last week touched 7¼ per cent, a level equaled or exceeded in only four years in the last 40 years. This was in 1920, 1914, 1907 and 1906. Call money rates climbed to 9 per cent for a time. Rates on commercial paper range from 5½ per cent to 5¾ per cent, the highest since 1921. The greater firmness reflects government financing and fall trade needs which are expanding steadily.



Sales Off but Production Gains

Steel Buyers Take in Material but Defer Commitments—Pig Iron Shipments Heavier—Order Rails—Finished Steel Prices Rising

FOLLOWING several weeks of almost unprecedented activity, the iron and steel markets are more tranquil. Most consumers have specified fully their third quarter contracts, some have purchased supplementally, and for a majority the mildly-deferred condition of mill deliveries insures a good flow of material into October. With producers quoting higher prices on most products, the general run of consumers is content to absorb current commitments and defer making new ones.

Large Users Are Stepping into Breach

But production is climbing to higher levels. September shipments of some large interests are setting an all-time record. As if to step into the breach as small and moderate-size buyers relax, tonnage outlets for iron and steel are opening up. Important bridge and structural projects are developing, some large pipe lines are maturing and rail requirements now being placed or in early prospect aggregate 400,000 tons.

A survey by IRON TRADE REVIEW of consumers' steel stocks in the more important consuming centers fails to disclose any noteworthy expansion in the past sixty days. The occasional increase that is revealed is attributed to the necessities of accelerated consumption. In fact, considering the higher rate of consumption, users' stocks on Oct. 1 will be relatively lighter than sixty days ago. It is apparent that the record steel production of July, August and probably also September has its roots in definite consumptive requirements.

Sheet Mills Determined to Cut Discount

Pig iron prices appear to be holding firmly at recently advanced levels, but in steel the situation is more spotty. Such contracts as have been written for steel bars, plates and shapes have generally carried a $2 rise. Sheet producers are waging a determined fight for higher prices and a reduced cash discount; some large consumers have accepted both conditions while others, notably some automotive interests, have tendered business on the old basis only to have it refused. Extensions of third quarter prices on tonnage requirements of hot rolled strip have been granted, but advances have been won from some cold

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Sept. 26, 1928	August 1928	June 1928	Sept. 1927
PIG IRON				
Bessemer, del., Pittsburgh	$19.01	18.76	18.76	19.86
Basic, valley	16.25	16.00	15.81	17.15
Basic, eastern, del. eastern Pa.	19.00	19.00	19.10	19.75
No. 2 foundry, del., Pittsburgh	18.76	18.26	18.61	19.26
No. 2 foundry, Chicago	18.50	17.60	18.00	19.50
*Southern No. 2, Birmingham	16.25	15.65	15.90	17.25
*Southern Ohio, No. 2 Ironton	19.00	19.00	19.00	19.00
**No. 2X, Virginia furnace	20.50	20.00	20.50	21.50
**No. 2X, eastern, del. Phila.	21.26	20.76	21.26	21.01
Malleable valley	17.25	17.00	17.00	17.50
Malleable, Chicago	18.50	17.60	18.00	19.50
Lake Superior charcoal del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.01	18.01	18.76	18.76
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	94.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.75	2.75	2.60	2.85
Connellsville, foundry, ovens	3.75	3.75	3.50	4.00
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.00	32.60	33.90
Sheet bars, open-hearth, Pittsburgh	33.00	32.20	33.50	33.90
Billets, open-hearth, Pittsburgh	32.00	32.00	32.50	33.00
Wire rods, Pittsburgh	42.00	42.00	44.00	43.00

	Sept. 26, 1928	August 1928	June 1928	Sept. 1927
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.90	1.85	1.85	1.80
Steel bars, Chicago	2.00	2.00	2.00	1.85
Steel bars, Philadelphia	2.27	2.17	2.17	2.07
Iron bars, Chicago	2.00	2.00	2.00	2.00
Shapes, Pittsburgh	1.90	1.85	1.85	1.80
Shapes, Philadelphia	2.11	2.01	2.06	2.02
Shapes, Chicago	2.00	2.00	2.00	1.85
Tank plates, Pittsburgh	1.90	1.85	1.85	1.80
Tank plates, Philadelphia	2.15	2.10	2.10	2.07
Tank plates, Chicago	2.00	2.00	2.00	1.85
Sheets, black, No. 24, Pittsburgh	2.70	2.65	2.70	3.00
Sheets, blue anl., No. 10, Pittsburgh	2.00	2.00	2.00	2.25
Sheets, gal., No. 24, Pittsburgh	3.50	3.50	3.55	3.85
Sheets, black, No. 24, Chicago	2.90	2.80	2.80	3.15
Sheets, blue anl., No. 10, Chicago	2.15	2.15	2.15	2.40
Sheets, galvanized, No. 24, Chicago	3.65	3.65	3.70	4.00
Plain wire, Pittsburgh	2.40	2.40	2.50	2.40
Wire nails, Pittsburgh	2.55	2.55	2.60	2.55
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.50
SCRAP				
Heavy melting steel, Pittsburgh	17.00	15.00	14.70	15.00
Heavy melting steel, eastern Pa.	15.25	12.75	13.15	14.00
Heavy melting steel, Chicago	13.00	12.65	12.60	12.20
No. 1 wrought, eastern Pa.	14.50	14.80	15.25	15.75
No. 1 wrought, Chicago	12.90	12.40	12.70	12.70
Rails for rolling, Chicago	16.25	15.00	14.85	15.20

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.10c to 2.25c
New York, del.	2.175c to 2.425c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland, delivered	2.09c to 2.19c
Buffalo	2.00c
Birmingham	2.05c to 2.15c
Pacific Coast, c.i.f.	2.20c to 2.30c

STRUCTURAL SHAPES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.11c
New York, del.	2.14c to 2.19c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland, delivered	2.09c to 2.19c
Buffalo	2.00c
Birmingham	2.05c to 2.15c
Pacific Coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh	1.90c to 2.00c
Chicago	2.00c
Birmingham	2.05c to 2.15c
Lackawanna, N. Y.	2.05c to 2.10c
Pacific Coast, c.i.f.	2.35c
Cleveland	1.90c to 2.05c
Philadelphia, del.	2.27c to 2.32c
New York, delivered	2.29c to 2.34c
Boston, delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.85c to 1.90c
Eastern mills	1.85c

IRON

Chicago	2.00c
New York, delivered	2.14c to 2.24c
Philadelphia, delivered	2.12c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh billet, cut lengths	2.25c
Stock lengths from mill	2.00c
Chicago, billet	2.30c to 3.00c
Chicago, rail steel	2.00c to 2.60c
Chicago, rail steel, road and bridge work	1.85c to 1.95c
Philadelphia	2.47c

COLD FINISHED STEEL

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.20c
Shafting (turned, polished) Pittsburgh	2.20c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.55c to 3.00c
Cold finished steel bars, Cleve.	2.25c

TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25
Gary, Ind., base 10 cents higher.	
Long ternes, primes, No. 24	4.10c

*Price subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh base	2.65c to 2.75c
No. 24, Philadelphia, delivered	3.07c
No. 24, Gary, Indiana Harbor	2.85c
No. 24, Chicago, delivered	2.90c
No. 24, Birmingham, base	2.90c

TIN MILL BLACK

No. 28, Pittsburgh, base	2.90c
No. 28, Gary, base	2.95c to 3.00c

GALVANIZED

No. 24, Pittsburgh, base	3.50c to 3.60c
No. 24, Philadelphia, delivered	3.82c
No. 24, Gary, Indiana Harbor	3.60c
No. 24, Chicago, delivered	3.65c
No. 24, Birmingham, base	3.70c

BLUE ANNEALED

No. 10, Pittsburgh, base*	2.00c
No. 24, Philadelphia, delivered	2.22c to 2.42c
No. 10, Gary, Indiana Harbor	2.10c
No. 10, Chicago, delivered	2.15c
No. 10, Birmingham, base	2.20c

*Plus 0.10 cents for 45 inches or wider.

AUTOMOBILES

No. 20, Pittsburgh, base	4.00c

FURNITURE

No. 24, Grade A, Pittsburgh	3.85c to 3.90c
No. 24, Grade B, Pittsburgh	3.65c to 3.70c

(*Turn to the following page*)

strip users. No more than the usual irregularities are apparent in wire products. Semifinished quotations have not yet been tested, coke is steady and scrap is calmer.

Rail awards include 45,500 tons by the Chesapeake & Ohio, 40,000 tons by the Northern Pacific, 15,000 tons by the Great Northern and 5200 tons by the Colorado & Southern, a total of 105,700 tons. The Burlington is expected to place 30,000 tons soon, the New York Central 200,000 tons and the Pennsylvania an unstated tonnage. Chicago district mills have benefited chiefly by actual business placed, and part will be rolled next quarter. The Canadian National railroad has bought 20 locomotives and has 35 pending.

Bar Delivery Deferred at Chicago

So heavy have soft steel bar specifications been at Chicago the past three weeks that the record of late March has been approached and deliveries on some sizes are thirty days deferred. One plate mill at Pittsburgh is booked solid through the fourth quarter. Featuring prospect structural work is a 20,000-ton bridge at New York on which bids will be asked shortly.

Sheet demand has surged in to Chicago mills sufficiently to provide mills there with the best backlogs this year. Rumors of higher prices in that district persist. Automotive requirements in the Pittsburgh and Youngstown districts are persistent and conform with continuation of the August record in automotive production. A showdown on the revised sheet discount seems certain this week.

Shipments of pig iron have been so accelerated the past week that the August rate has been surpassed and the September movement therefore will be the heaviest this year. The lake furnaces are the most active, 37,000 tons having been placed at Cleveland this week. Modest premiums are paid at St. Louis for spot iron.

Corporation Up to 84 Per cent

A sharp rise in the operating rate of Steel corporation subsidiaries to 84 per cent, which also describes the average for independent producers, seems to assure an ingot record for September. A banked stack has been lighted at Gary, Ind., resulting in a fractional advance in the ingot rate at Chicago to 81 per cent, contrasted with 60 per cent a year ago. Buffalo producers hold at 87 per cent and Pittsburgh at about 85. Mahoning valley independents are averaging 87 per cent this week, or ten points above corporation units.

British makers of railroad equipment have booked good export business in the past week, according to a cable to IRON TRADE REVIEW. German exports are increasing and prices are more profitable. Belgian prices still are rising.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Sept. 26, 1928)	$35.29
Last week (Sept. 19, 1928)	35.23
One month ago (August, 1928)	34.96
Three months ago (June, 1928)	35.30
One year ago (September, 1927)	36.18
Ten years ago (September, 1918)	56.56
Fifteen years ago (September, 1913)	25.55

For the sixth consecutive week the IRON TRADE REVIEW composite of fourteen leading iron and steel products has risen. This week it advanced six cents, to $35.29, compared with $35.30 three months ago.

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED
SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIPS

Hot strip, under 3-inch, Pitts. 2.10c to 2.20c
Hot strip, 3 to 6-inch, Pitts. 2.00c to 2.10c
Hot strip, 6 to 12-inch, Pitts. 1.80c to 1.90c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut lengths, 1.90c plate basis, or 2.00c blue annealed basis.
Hot strip, bands, under 3-in., Chicago 2.30c
Hot strip, bands, 3 to 6-in. Chi. 2.20c
Hot strip, bands, 6 to 12-in., Chi. 2.00c
Hot strip, 12 to 24 in., Chi..... 2.10c
blue annealed sheet basis.
Cold rolled strip, hard coils, 16 inches and wider by 0.100-inch and heavier, base Pitts., Cleve., (3 tons and over)..... 2.75c to 2.85c
Worcester, Mass. (3 tons and over) ..... 3.00c to 3.10c
Quantity extras: 5999 to 2000 pounds, 0.25c; 1999 to 1000 pounds, 0.65c.

ALLOY STEEL

Hot Rolled
F.o.b. Mills
Alloy Quality Bar Base is 2.75c

S.A.E. Series Number	Alloy differential	Net, 100 lb. bars
2000	0.25	$3.00
2100	0.55	3.30
2300	1.50	4.25
2500	2.25	5.00
3100	0.55	3.30
3200	1.35	4.10
3300	3.80	6.55
3400	3.20	5.95
4100 0.15-0.25 Mo.	0.50	3.25
4100 0.25-0.40 Mo.	0.70	3.45
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.80
5100 0.60-0.90 Cr.	0.35	3.10
5100 0.80-1.10 Cr.	0.45	3.20
5100 Chrome Spring	0.20	2.95
6100 Bars	1.20	3.95
6100 Spring Steel	0.95	3.70
Chrome Nickel Vanadium..	1.50	4.25
Carbon Vanadium	0.95	3.70
9250	0.25	3.00

TUBING

Boiler
Carload Discounts—Less-carloads 4 points Lower—F.o.b. Pittsburgh Mills
Steel 3¼ to 3¾-inch 42½
Charcoal iron, 3¼ to 4½-inch 9
Seamless hot rolled 3¼ to 3½-inch.... 56
Further discounts of six 5 per cents for 21,000 pounds or more on lap welded steel. On charcoal two 10's and one 2½ on 12,000 pounds or more.

COLD DRAWN SEAMLESS
F.o.b. mill in desirable quantities
Random length over 5 feet .....55 per cent
Selected lengths, 1 to 18 feet .....53 per cent

WIRE PRODUCTS

To Jobbers in Carloads
F.o.b. Cleveland and Pittsburgh base
Dealers 10 cents per 100 pounds extra

Bright plain wire, No. 9 gage.. 2.40c
Annealed fence wire 2.55c
Galvanized wire, No. 9 gage.... 3.00c
Barbed wire, painted 2.95c
Barbed wire, galvanized 3.20c
Per 100 lbs.
Wire nails $2.55
Galvanized nails, plus differ. 4.55
Polished staples 3.00
Galvanized staples 3.25
Coated nails, 100 lb. kegs, Sept. 1, 1926 extras apply.... 2.55
Woven wire fencing (retailers) 12½ gage, 26-in. high, 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts. $20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there: Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

CAST IRON WATER PIPE

Prices per net ton
Class B Pipe

Six-inch and over, Birming'm..$34.00 to 35.00
Four-inch, Birmingham ..... 38.00 to 39.50
Four-inch, Chicago ..... 46.20 to 47.20
Six-inch to 24-inch, Chicago..... 42.20 to 43.20
Four-inch, New York ..... 40.50 to 41.60
Six-inch and over, New York 37.60
Standard fittings, Bir. base..... $100.00

Six to 24-inch base; over 24-inch; plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50½
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less.
*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent on galvanized by 1½ points with a supplementary 5 per cent.

CHAIN, PILING, CUT NAILS

Cut nails, c.l., f.o.b. mills..... 2.70c
Cut nails, l.c.l. f.o.b. mills..... 2.80c
Chain,, 1-in., proof coil, Pitts.... 6.00c
Sheet piling base, Pittsburgh.. 2.25c

RAILS, TRACK MATERIAL

Standard bessemer rails, mill $43.00
Standard open-h'th rails, mill $43.00
Relaying rails, St. Louis.....$24.00 to 31.00
Relay rails, Pitts. 60 to 90 lb...$22.00to 27.00
Light rails, 25 to 45, mills..... $36.00
Angle bars, Chicago base..... 2.75c
Spikes, railroad, Pittsburgh.... 2.80c
Spikes, small railroad, ⅞-inch and smaller, Pitts..... 2.80c
Spikes, boat and barge, Pitts. 3.00c
Spikes, railroad, Chicago 2.80c
Track bolts, Pitts., steam roads 3.80c
Track bolts, Pitts., stand, jobbers .....70 off list
Track bolts, Chicago 3.80c
Tie plates, Chicago, Pitts..... $43.00

BOLTS AND NUTS

Birmingham and Chicago
Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.
Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS
All sizes, cut thread ..... 60 to 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Eagle list ..... 60 to 70 off

MACHINE BOLTS
All sizes, cut thread ..... 60 to 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Lag screws ..... 60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads 60 to 70 off
Tap bolts ..... 60 to 70 off
Blank bolts ..... 60 to 70 off
Stud bolts without nuts ..... 60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.
Tire bolts .....60-5 off

Nuts
Semifinished .....60 to 70 off

HEXAGON CAP SCREWS
Milled .....80-10-10 off
Upset 1 in. diam. and smaller .....85-5 off

SQUARE HEAD SET SCREWS
Milled .....80-10 off
Upset 1 in. diam. and smaller.....80-10-10 off

RIVETS

Struct., c.l., Pitts.-Cleve..... 2.80c to 2.90c
Structural, c.l., Chicago 3.00c
**⅞-inch and smaller, Pitts.....70 and 10 off
Chi., Cleve. .....70 to 70 and 10 off
**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.....$6.50 to 6.75 off
Wrought, c.l., Chicago dist.....$6.70 to 6.90 off
Lock: To dealers .....85-5 off
Lock: To consumers .....85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices Per gross ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth .....$32.00 to 33.00
Pittsburgh, bessemer ..... 32.00 to 33.00
Youngstown 32.00
Cleveland 33.00
Philadelphia 38.30
Chicago 33.00
Forging, Chicago 38.00
Forging, Pittsburgh 38.00
Forging, Philadelphia 43.30

SHEET BARS
Pittsburgh .....$32.00 to 33.00
Youngstown 33.00
Cleveland ..... 32.50 to 33.00
Chicago 34.00

SLABS
Pitts., Young., and Cleve.....$32.00 to 33.00

WIRE RODS
Pittsburgh, Cleveland $42.00
Chicago 45.00

SKELP
All grades, Pittsburgh ..... 1.85c to 1.90c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½%.... $4.55
Mesabi bessemer, 51½% 4.40
Old range nonbessemer 51½% 4.40
Mesabi nonbessemer, 51½%..... 4.25

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% 8.00
Copper free low phosphorus 58 to 65 per cent ..... nominal

FOREIGN ORE
Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese.. 10.50 to 11.00
North African low phosphorus 10.00 to 11.00
Swedish foundry or basic, 65%—none offered
Spanish and North African basic, 50 to 60 per cent ..... 8.50 to 9.00
Newfoundland foundry, 55%.... 8.50

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.

Brazilian ..... 36 to 38 cents
Indian ..... 35 to 38 cents
Caucasian (53-55 per cent) ....38 to 40 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton....$16.50 to 17.00
Washed gravel, imported duty paid, east, tidewater, net ton $15.25 to 15.75

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality
Pennsylvania .....$43.00 to 46.00
Ohio ..... 43.00 to 46.00
Illinois ..... 43.00 to 46.00
Kentucky ..... 43.00 to 46.00
Missouri ..... 43.00 to 46.00
Maryland ..... 43.00 to 46.00
Georgia and Alabama ..... 40.00 to 45.00

Second Quality
Pennsylvania ..... 35.00 to 38.00
Ohio ..... 35.00 to 38.00
Illinois ..... 35.00 to 38.00
Kentucky ..... 35.00 to 38.00
Missouri ..... 35.00 to 38.00
Maryland ..... 35.00 to 38.00
Georgia and Alabama ..... 30.00 to 35.00

SILICA BRICK
Pennsylvania 43.00
Joliet, Ill., East Chicago, Ind.... 52.00
Birmingham ..... 50.00 to 51.00

MAGNESITE BRICK
Per Net Ton
9 x 4½ x 2½ 65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base
Dead-burned grain magnesite.... 40.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base.
9 x 4½ x 2½ 45.00

Pig Iron

Volume of Shipments Continues to Climb—Buying Still Fairly Active—Prices Firm, but Show No Further Tendency to Advance

A HIGH rate of shipments is the important feature of the pig iron market at present. The movement is much brisker than in August, and leading producers report the tonnage moved this month will greatly exceed that of August, and therefore will be the largest of any month to date this year. Shipping instructions have been particularly active in the past week. Buying for fourth quarter continues fairly active, though the largest melters evidently have covered for that period. Some inquiries are beginning to appear for first quarter. Business in the Middle West continues the most active, with sales aggregating 37,000 tons in the past week by furnace interests at Cleveland, and substantial buying at Chicago. The new prices are firmly established.

PITTSBURGH, Sept. 25.—Pig iron now is in a quiet market, with buying on a broad scale lacking. Some interests note better demand for foundry iron, as regards the number of buyers and the tonnage taken. This upturn, however, is only moderate, although the melt in this district is a shade heavier than a month ago. Valley producers adhere to the higher prices announced a short time ago, but quietness of the market precludes an actual test, and reports of sales at these figures still are lacking. Small transactions in bessemer and malleable are noted at $17.25, valley, which generally is regarded as minimum. The market for basic iron is dull. Some producers are attempting to obtain $16.50, but few sales are made at this level. Most sellers are firm at $17 for No. 2 foundry iron, at which sales are being made. Competition from steelworks for this grade is reported, and while occasional weakness is noted in the price several sellers report they have not lost any business by quoting $17.

Boston, Sept. 25.—Pig iron demand is quiet, sales in the past week being less than 1000 tons. Most of the iron bought is for filling in. Prices hold firm.

New York, Sept. 25.—Sales of pig iron the past week aggregated nearly 10,000 tons, of which 3000 tons are to be shipped to points outside this district. Worthington Pump & Machinery Corp. closed for around 2000 tons. Prices are firmer. Buffalo producers generally are asking $17, base, Buffalo, as their minimum on foundry iron for shipment to this territory. On eastern Pennsylvania foundry iron the usual price is $20, base, furnace. Scattered lots of Indian foundry iron continue to be sold at $20.50, base, duty paid, tidewater. Scattered lots of Dutch foundry iron continue to sell around $21, duty paid, tidewater. A cargo of about 2400 tons of Dutch foundry iron, all of which has been sold, is enroute from Rotterdam to Bridgeport, Conn.

Buffalo, Sept. 25.—New pig iron demand is quiet. Prices range from $17 for eastern district iron, which one seller quotes on low silicon foundry for the last quarter, to $18, which is generally asked for the same grade for shipment after Jan. 1. One more furnace in this district will go into production this week.

Cleveland, Sept. 25.—Pig iron shipments are at the highest point of the year thus far. Leading producers say their September tonnage will exceed by a considerable margin their shipments in August. The improvement has been continuous from month to month since spring. While shipments in the past week were larger than expected, there is nothing immediately in sight to indicate that the movement will be slowed up. Makers look for good business, and steady and large shipments all through the fourth quarter. While the largest consumers have covered for that period, considerable iron remains to be purchased, and the weekly volume of business is holding up. Sales by furnace interests with headquarters in Cleveland totaled 37,000 tons in the past week, compared with 32,000 tons in the week preceding. This week begins with about 5000 tons pending. Furnace interests now are selling on the higher price bases. The established level for foundry and malleable pig iron for shipment from Cleveland to outside districts is $17.50, base, furnace, while for shipment in the local 50-cent switching area the price is $18, base, furnace. The market in western Ohio, southern Ohio and Indiana for shipment from a lake furnace is firm at $18, base, and in lower Michigan, $18.50, base.

Cincinnati, Sept. 25.—The pig iron market is quieter. The Louisville & Nashville railway's inquiry for 150 tons of foundry iron of various grades will be closed this week. The inquiry for 350 tons for the Worthington Pump & Machinery Corp.'s plant in this city still is pending. Small sales of southern iron are reported. Prices are firm.

Chicago, Sept. 25.—Quiet negotiations are underway for further tonnages of northern pig iron for fourth quarter. Due to the approaching end of third quarter, spot sales have declined slightly from the recent high rate, but even with all available merchant furnaces in the district active, shipments are exceeding production and stocks are at the lowest point in months. Some good sales of both foundry and malleable iron have been closed west of here in Illinois. Buying in the Milwaukee district is active. Several inquiries are out for charcoal iron. The price of $18.50, Chicago furnace, for No. 2 foundry and malleable is steady.

Several good size inquiries for pig iron for first quarter have appeared.

St. Louis, Sept. 25.—An unusually heavy demand for spot shipments features the pig iron situation here. Scant stocks and delayed deliveries by certain blast furnaces have forced numerous melters to enter the market for small tonnages. In some instances slight premiums have been offered for quick delivery. Shipments generally are holding up well, and

(*Concluded on Page* 811)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$17.25 to 17.50
Bessemer, del. Pittsburgh	19.01 to 19.26
Basic, valley furnace	16.25 to 16.50
Basic, del. Pittsburgh	18.01 to 18.26
Basic, Buffalo furnace	17.00
Basic, del. eastern Pa.	19.00 to 19.25
Malleable, valley furnace	17.25 to 17.50
Malleable, del. Pittsburgh	19.01 to 19.26
Malleable, del. Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	18.00
Malleable, del. eastern Pa.	20.50 to 21.00
No. 1 foundry, Chicago furnace	19.00
No. 1X, eastern del., Phila.	21.76
No. 1X, Buffalo furnace	19.00
No. 2 foundry, valley furnace	17.00
No. 2 foundry, del. Pittsburgh	18.76
No. 2 plain, Buffalo furnace	17.50
No. 2 foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.50 to 20.00
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	18.50
No. 2 plain, del., Phila.	20.76
No. 2 plain, Virginia furnace	20.00
No. 2 plain, N. J., tidewater	20.01 to 21.28
No. 2 Alabama, Birmingham	16.25
No. 2 Alabama, del. Cincinnati	19.94
No. 2 Tenn., Birmingham base	16.25
No. 2 Tenn., del. Cincinnati	19.94
No. 2 Alabama, del. Chicago	22.26
No. 2 Alabama, del. Cleveland	22.51
No. 2 Alabama, del. St. Louis	20.67
No. 2X, east, N. J., tidewater	20.51 to 21.78
No. 2X, eastern, del. Phila.	21.26
No. 2X, foundry, Buffalo furnace	18.00
No. 2X, eastern, del. Boston	20.91 to 21.41
No. 2X, Virginia furnace	20.50
Gray forge, val., del. Pittsburgh	18.01 to 18.26
Low phos., standard, valley	26.50
Low phos., standard, Phila.	24.26 to 24.76
Low phos. copper bearing fur.	23.00 to 23.50
Charcoal, Birmingham	28.00
Charcoal, Superior, del., Chicago	27.04

CANADIAN PRICES

No. 2 foundry, del. Toronto	23.60
No. 2 foundry, del. Montreal	25.00
Malleable, del. Toronto	23.60
Malleable, del. Montreal	25.00
Basic, del. Montreal	24.00

Silvery iron, Jackson county (Ohio) furnace in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Coke

Foundry and Blast Furnace Fuel Orders More Active—Heating Coke Demand Falls

DEMAND for foundry coke is more active, reflecting the increase in the melt in several important districts. While by-product coke manufacturers are reaffirming September prices for October delivery, spot beehive foundry fuel continues $3.75, Connellsville. Slightly more activity is reported in demand for blast furnace coke, on which the price continues $2.75, Connellsville.

Pittsburgh, Sept. 25.—Beehive coke is in a fairly steady market, with slightly more activity in sales of furnace and heating grades. Occasional spot sales of blast furnace coke command $2.75, ovens, but most of the activity is confined to contract business. The majority of contracts cover requirements until the end of the year and little activity is noted in covering for fourth quarter. Some foundries are busier and shipments to them are slightly heavier. Spot buyers generally pay $3.75 for good grades of foundry fuel. Seasonal expansion in demand for heating coke fails to measure up to activity in this field several years ago. Coke production in the Connellsville district in the week ended Sept. 15 was 32,850 tons, against 33,100 tons in the preceding week, according to the *Connellsville Courier*.

Boston, Sept. 25.—Demand for furnace coke in the past two or three weeks appears to have satisfied present requirements, resulting in a slowing down of orders. Prices, however, are firm.

New York, Sept. 25.—Great improvement is noted in specifications against second half foundry coke contracts, reported by by-product and beehive coke producers. New sales also are somewhat better. By-product foundry coke continues unchanged at $11, delivered to most New England consuming points, and $9 to $9.40 delivered at Newark, N. J., depending on freight rate. High-grade beehive foundry coke continues $4.85, Latrobe, Pa., equivalent to $8.56 delivered at Newark, N. J. Scattered sales of Connellsville foundry coke are bringing $3.75 to $4, Connellsville, equivalent to $7.66 to $7.91 delivered at Newark.

Cincinnati, Sept. 25.—Foundry coke is moving in better volume than in August and furnace coke also is in heavier demand. By-product coke makers say there will be no change in prices for October shipment.

St. Louis, Sept. 25.—New orders and specifications for metallurgical coke continue satisfactory in volume. Consumers' stocks are considerably smaller than at the corresponding period last year or in 1926. Shipments to the West and Southwest have increased in recent weeks. Prices are steady. Demand for coal is showing slightly better than the usual seasonal improvement.

Birmingham, Ala., Sept. 25.—All by-product coke works in this district are in operation, but not at full capacity. Considerable foundry coke is being used locally. By-product foundry fuel is firm at $5, base, Birmingham.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$2.75 to 3.00
Connellsville foundry	3.75 to 4.85
New River foundry	6.50 to 7.00
New River furnace	6.50
Wise county foundry	4.50 to 5.25
Wise county furnace	3.75 to 4.25
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham	5.00
Indianapolis, del.	8.25
Ashland, Ky.	7.00
Portsmouth, O.	7.00
Detroit, ovens	8.50
Buffalo, ovens	9.00

Ferroalloys

Shipments Increase Over August—Active Fourth Quarter Expected

Pittsburgh, Sept. 25.—Ferroalloy shipments to a number of consumers so far this month have been larger than in the like period of August, This reflects activity in steel operations, since users are buying largely for current requirements. Although some small spot sales have been made, most transactions consist of contract business. Ferromanganese holds at $105, duty paid, seaboard, with spiegeleisen, 19 to 21 per cent, at $33. Demand for the latter has been more active. High carbon ferrochrome is steady at 11.00c, with 11.50c quoted for spot. Current business in practically all alloys shows a gain over the volume of last year, and sellers look for an active fourth quarter.

Chicago, Sept. 25.—Releases against ferromanganese contracts have been more liberal. Shipments of 50 per cent ferrosilicon are fully up to a year ago. A few sales of spiegeleisen are reported in this district on the basis of $33, eastern furnace, for carload lots of 19 to 21 per cent metal.

Iron Ore

Large Steel Interests Stepping Up Shipments—Small Lots Sold

IRON ORE PRICES, PAGE 796

Cleveland, Sept. 25.—While shipments of Lake Superior iron ore are larger than expected, and a heavy grain movement is in sight, it has not been necessary for ore shippers to engage outside vessel capacity, and no difficulty is anticipated in handling all the ore that will be required. The improvement in shipping instructions so far has affected mainly certain large steel interests, with well equipped transportation facilities. The amount of iron ore sold in a season in the open market is only equivalent to the volume of ore that is handled by the lake fleet in two weeks' time, namely about 4,000,000 tons. Occasional orders for small lots of ore for filling in purposes are noted. The market is firm.

Refractories

Sales Heavier Than in August and July—Prices Remain Steady

REFRACTORIES PRICES, PAGE 796

Pittsburgh, Sept. 25.—Sales of refractory material this month show an increase over August and July. This upturn is in line with the usual seasonal trend and consists mainly in expansion of small-lot business. New construction work entailing a large volume of material is lacking. Consumers are buying only for immediate requirements. Producers are hard pressed at times to make shipments. First quality fire clay and silica brick are steady at $43 to $46. Magnesite brick continues at $65 and chome brick at $45, base.

On an average, 94,371 passengers board American passenger trains every hour.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent domestic furnace	33.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	96.00
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

*These prices contract; spot $5 higher.

Scrap

Lack of Tonnage Holds Recent Price Increases but Upward Movement Is Checked

SMALL supply of iron and steel scrap continues to sustain recent increased quotations but the upward tendency has been checked by resistance on the part of melters. Dealer-covering of contracts makes most of present trading and some losses are being taken. Another large Pennsylvania railroad list closes Oct. 3.

Chicago, Sept. 25.—Iron and steel scrap prices continue the upward trend of the past five weeks, but the rise has been checked somewhat by a marking of time in several other districts. Railroad lists are small and yards are practically cleaned of prepared scrap. The Santa Fe and Illinois Central lists last week were productive of only light tonnages, and practically no heavy melting steel. The price of heavy melting steel is nominal at $13 to $13.50, but close to $14 has been paid for railroad scrap, and for tonnage more than $14 would be asked for the present high-priced accumulations. Cast bornigs were sold at $10.50, gross, which represents an advance of 25 cents. Railroad malleable continues strong as difficulty is encountered in filling orders. The latest sale was at $15. Railroad scrap is higher, short rails having been sold at $17.50, an advance of 25 cents; re-rolling rails at $16.75, a similar advance; and angle bars at $16.50. No. 1 railroad wrought is strong at $11.50 to $12, net. Sellers are hesitating to book future orders on the present market. Gary and Indiana Harbor mills have bought fair

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$10.00 to 10.75
Boston, dealers	10.25 to 10.75
Buffalo, No. 1	15.00 to 15.75
Buffalo, No. 2	13.00 to 13.50
Chicago	13.00 to 13.50
Cincinnati, deal...	12.50 to 13.00
Cleveland, No. 1	13.50 to 14.00
Cleveland, No. 2..	13.00 to 13.50
Detroit, No. 1	11.75 to 12.25
Eastern Pa.	15.50 to 16.00
Eastern Pa. No. 2	13.00
Bethlehem deliv...	14.50
N. Y., deal., R. R.	9.85 to 11.50
N. Y., deal., yd.	8.00 to 9.00
Pittsburgh, No. 1..	16.50 to 17.00
St. Louis, No. 1..	12.00 to 12.50
St. Louis, No. 2....	12.50 to 13.00
Valleys, No. 1	15.00 to 15.50

COMPRESSED SHEETS

Buffalo	13.50 to 14.00
Chicago	11.50 to 12.00
Cleveland	13.00 to 13.50
Detroit	11.75 to 12.25
Pittsburgh	16.50 to 17.00
Valleys	15.00 to 15.50
E. Pa. new mat.	13.00

BUNDLED SHEETS

Buffalo	10.50 to 11.00
Cincinnati, deal...	10.00 to 10.50
Cleveland	12.00 to 12.50
Eastern Pa.	11.50 to 12.00
Pittsburgh	14.25 to 14.75
St. Louis	7.75 to 8.25

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Cincinnati	9.25 to 9.75
Detroit	8.00 to 8.50
St. Louis	7.75 to 8.25

STEEL RAILS, SHORT

Birmingham	10.50 to 11.00
Boston	8.25 to 8.75
Buffalo	16.00 to 16.50
Chicago	16.75 to 17.25
Cincinnati, deal...	17.00 to 17.50
Detroit	14.50 to 15.00
St. Louis	15.75 to 16.25

STOVE PLATE

Birmingham	12.00 to 12.50
Boston consumers	10.00
Buffalo	13.75 to 14.25
Chicago, net	11.50 to 12.00
Cinn., deal., net..	9.00 to 9.50
Cleveland	12.00 to 12.50
Detroit, net	10.75 to 11.25
Eastern Pa.	12.50 to 13.00
N. Y., deal., mill...	8.25 to 8.75
Pittsburgh	11.50 to 12.00
St. Louis	11.50 to 12.00

SHOVELING STEEL

Chicago	13.00 to 13.50
Pittsburgh	12.50 to 13.00
St. Louis	12.50 to 13.00

KNUCKLES, COUPLERS SPRINGS

Buffalo	16.00 to 16.50
Chicago	15.50 to 16.00
Eastern Pa.	16.00 to 17.00
Pittsburgh	17.50 to 18.00
St. Louis	14.00 to 14.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.00 to 16.50
Cincinnati, deal.	13.50 to 14.00
Eastern Pa.	17.50 to 18.50
Pitts. billet and bloom crops	20.00 to 20.50
Cleve. billet and bloom crops	17.00 to 17.50

FROGS, SWITCHES, GUARDS

Chicago	15.00 to 15.50
St. Louis	13.50 to 14.00

ANGLE BARS—STEEL

Buffalo	14.00 to 14.50
Chicago	16.00 to 16.50
St. Louis	13.00 to 13.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	9.00 to 9.50
Buffalo, No. 1	11.50 to 12.00
Buffalo, No. 2	14.50 to 15.00
Chicago, No. 1	12.90 to 13.45
Chicago, No. 2	13.00 to 13.50
Cinn., No. 2	12.50 to 13.00
Eastern Pa.	15.00 to 16.00
N. Y., No. 1 deal..	11.00 to 11.50
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2....	16.50 to 17.00
St. Louis, No. 1	10.50 to 11.00
St. Louis, No. 2..	12.50 to 13.00

WROUGHT PIPE

Boston, dealers	9.00 to 9.50
Eastern Pa.	14.50 to 15.00
Buffalo	12.00 to 12.50
New York, deal...	10.25 to 10.75

YARD WROUGHT

Boston	8.00 to 8.50
Eastern Pa.	15.00 to 15.50

BUSHELING

Buffalo	13.00 to 13.50
Chicago, No. 1	11.00 to 11.50
Chicago, No. 2	8.50 to 9.00
Cinn., No. 1 deal.	11.00 to 11.50
Cinn., No. 2	6.50 to 7.00
Cleveland, No. 2....	10.00 to 10.25
Detroit, No. 1	10.50 to 11.00
Detroit, mixed	7.25 to 7.50
St. Louis, No. 1..	9.50 to 10.00

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	6.00 to 6.50
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati, deal...	8.50 to 9.00
Cleveland	8.50 to 9.00
Detroit	8.00 to 8.50
Eastern Pa.	11.00 to 11.50
New York, deal....	7.00 to 8.00
Pittsburgh	11.50 to 12.00
St. Louis	7.00 to 7.50

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	6.00 to 6.50
Buffalo	10.00 to 10.50
Cincinnati, deal...	9.00 to 9.50
Cleveland	10.00 to 10.25
Detroit	8.50 to 9.00
Eastern Pa.	10.00 to 10.50
New York, deal.....	6.25 to 6.75
Pittsburgh	12.50 to 13.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	8.00 to 9.00
Boston, chem	9.50 to 10.00
Boston, dealers	6.00 to 6.50
Buffalo	10.00 to 10.50
Chicago	10.00 to 10.50
Cincinnati, deal...	9.00 to 9.50
Cleveland	10.00 to 10.25
Detroit	8.50 to 9.00
Eastern Pa.	11.00 to 11.50
Eastern Pa., chem.	14.50 to 15.00
New York, deal.....	6.75 to 7.25
Pittsburgh	12.50 to 13.00
St. Louis	9.00 to 9.50
Valleys	12.50 to 13.00

PIPES AND FLUES

Chicago, net	8.50 to 9.00
Cincinnati, deal.....	8.25 to 8.75

RAILROAD GRATE BARS

Buffalo	11.75 to 12.25
Chicago, net	12.25 to 12.75
Cincinnati	9.50 to 10.00
Eastern Pa.	12.50 to 13.00
New York, deal.....	8.00 to 8.50
St. Louis	11.00 to 11.50

FORGE FLASHINGS

Boston, dealers	8.50 to 9.00
Buffalo	12.50 to 13.00
Chicago	9.00 to 9.50
Cleve., over 10 in.	11.50 to 11.75
Detroit	9.50 to 10.00
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston, dealers	6.00 to 6.50
Chicago	16.50 to 17.00
Eastern Pa.	11.50 to 12.50

ARCH BARS AND TRANSOMS

Chicago, net	20.50 to 21.00
St. Louis	18.25 to 18.75

Iron, Steel Works Scrap

AXLE TURNINGS

Boston deal	6.50 to 7.00
Buffalo	11.50 to 12.00
Chicago	11.00 to 11.50
Cleveland	12.50 to 13.00
Eastern Pa.	12.00 to 13.00
Pittsburgh	15.00 to 15.50
St. Louis	9.50 to 10.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston, ship point	15.50 to 16.00
Buffalo	17.50 to 18.00
Chicago	18.50 to 18.75
Cleveland	16.00 to 16.50
Eastern Pa.	19.00 to 20.00
Pittsburgh	18.50 to 19.00
St. Louis	18.00 to 18.50

SHAFTING

Boston, ship point	14.00 to 14.50
Chicago	17.35 to 17.90
Eastern Pa.	19.00 to 19.50
New York, deal....	15.00 to 16.00
St. Louis	17.00 to 17.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 12.50
Boston, con.	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	16.00 to 16.50
Chicago, iron	13.00 to 13.50
Chi., rolled steel....	16.50 to 17.00
Cincinnati	12.50 to 13.00
Eastern Pa., cast	16.50 to 17.00
Eastern Pa. rolled	16.50 to 17.00
N. Y., iron, deal.	12.50 to 13.00
Pittsburgh, iron....	15.50 to 16.00
Pittsburgh, steel....	16.50 to 18.00
St. Louis, iron	13.00 to 13.50
St. Louis, steel	15.00 to 15.50

NO. 1 CAST SCRAP

Birmingham, cup..	13.00 to 13.50
Buffalo	14.75 to 15.25
Boston, textile	15.50 to 16.00
Buffalo	14.25 to 14.75
Chicago, mach.	16.50 to 17.10
Chicago, railroad....	15.70 to 16.25
Chicago, agri.	14.30 to 14.85
Cincinnati, mach. cupolas, net deal.	15.00 to 15.50
Cleveland, cupola..	16.00 to 16.50
Detroit, net	12.25 to 12.75
Eastern Pa. cupola	16.00 to 17.00
N. Y., cup., deal.	13.00 to 13.50
Pittsburgh, cupola	14.25 to 14.75
San Fran., del.	20.00 to 21.00
Seattle	15.00 to 15.25
St. Louis	13.00 to 13.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	11.50 to 12.00
Cleve., breakable..	12.25 to 12.75
Detroit, auto., net	17.00 to 18.00
Eastern Pa.	16.50 to 17.00
New York, deal.	12.50 to 13.00
Pittsburgh	13.00 to 13.50

MALLEABLE

Boston, railroad ..	13.50 to 14.50
Buffalo	15.50 to 16.00
Chicago, agri.	13.00 to 13.50
Chicago, railroad....	14.50 to 15.00
Cinn., R. R., deal.	12.50 to 13.00
Cinn.. agri., deal.	12.00 to 12.50
Cleveland, agri. ..	15.00 to 15.50
Cleveland, rail. ..	15.00 to 16.00
Detroit, auto	14.50 to 15.00
Pittsburgh, rail.	14.00 to 14.25
St. Louis, rail	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	10.50 to 11.00
Boston, dealers	9.50 to 10.50
Buffalo	14.75 to 15.25
Chicago	16.25 to 16.75
Eastern Pa.	14.50 to 15.00
New York	10.50 to 11.00
Pittsburgh district	16.50 to 17.00
St. Louis	14.00 to 14.50

LOCOMOTIVE TIRES

Chicago, No. 1	14.00 to 14.50
Chicago, cut	16.00 to 16.50
St. Louis, No. 1....	12.25 to 12.75

LOW PHOS. PUNCHINGS

Chicago	15.50 to 16.00
Pittsburgh	17.00 to 17.50

quantities of heavy melting steel at $13.50.

Boston, Sept. 25.—Recent advances for scrap continued to hold well the past week but not enough business was done to judge the general situation. Movement of scrap was mainly in small lots, some going to the Pittsburgh district.

New York, Sept. 25.—Iron and steel scrap is showing greater stability than in several weeks. Dealers have advanced buying prices on only one grade, turnings, now holding at $7 to $8 a ton, an advance of 50 cents in the outside figure. This increase follows an advance at Phoenixville, Pa., with dealers paying $11.50, delivered. With the market on heavy melting steel higher here, Pittsburgh dealers are showing less interest, although still doing some buying.

Philadelphia, Sept. 25.—Consumers of iron and steel scrap are taking only small lots, at current prices. While Bethlehem is not buying, dealers have advanced heavy melting steel $1.50, to $14.50, delivered Bethlehem. Several lots of heavy breakable cast have been sold at $17. While $16.50 is being offered for this grade, it has not brought out any material. Dealers are paying the highest current prices in many instances.

Buffalo, Sept. 25.—Dealers report sales of No. 1 heavy melting steel at $15.75 and have advanced their asking price for additional material to $16. The largest steel works here is refusing to place orders at this price and announces its withdrawal from the market.

Pittsburgh, Sept. 25.—Comparatively little activity is noted in iron and steel scrap. Current transactions generally are by dealers covering on contracts. Supplies still are only moderate and the restricted volume being offered helps sustain current prices. Heavy melting steel is being sold at $16.75 and $17, with blast furnace scrap generally quoted at $12.50 to $13. Steel specialties are strong, and although $17.50 to $18 is the general range, higher prices are heard in some instances. Dealers look for little consumer buying until early in October.

The Pennsylvania railroad will close bids Oct. 3 at Philadelphia on 38,335 tons, including 7250 tons of heavy melting steel and 5670 tons of steel rail. The auxiliary list includes 4780 tons.

Cincinnati, Sept. 25.—Iron and steel scrap continues strong and in satisfactory movement, in small lots generally. Contract shipments are being taken liberally. Foundry melt is indicated as becoming heavier by many items. Heavy melting steel and grades that may be used as substitute are in strong demand.

St. Louis, Sept. 25.—Scant consumer stocks and rather acute scarcity of tonnage has been reflected in a sharp upturn in iron and steel scrap. Another factor of strength is the oversold condition of certain dealers, and their efforts to acquire material. Consumers are opposing the advance, and are taking only necessities in the effort to bring sellers to their terms.

Birmingham, Ala., Sept. 25.—Heavy melting steel, stove plate and No. 1 cast are the most active grades of iron and steel scrap. Heavy melting steel is quoted at $10 to $10.75.

Toronto, Ont., Sept. 25.—Toronto and Montreal dealers report steady demand for iron and steel scrap. Domestic consumption has improved since the first of the month and orders for spot and future delivery have increased. Hamilton and Toronto consumers are responsible for most of the new business, but outside consumers have also bought more. Advancing prices in the United States have resulted in agricultural implement concerns buying more extensively here and big contracts have been closed from these consumers.

Cleveland, Sept. 25.—One local mill has regular shipments of scrap coming to it from the railroads such as the New York Central, Big Four. Another is accepting material from dealers. Consumers are not buying but the market has lost none of its recent strength, No. 1 heavy melting steel being quoted at $13.50 to $14. Brokers say that if the steel industry saw only good business ahead for a period of months, it would be active in placing fresh orders for scrap. Blast furnace grades have become more plentiful and the range has narrowed to $10 to $10.25.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	5.00
Turnings	5.00
Heavy melting steel	7.00

TORONTO

Steel axles	13.50 to 14.00
Iron axles	15.50 to 16.00
Heavy melting steel	8.00 to 8.50
Turnings	6.50 to 7.00
No. 1 mach. cast (net)	14.50 to 15.00
Malleable, (net)	12.50 to 13.00
Stove plate (net)	8.50 to 9.00

Discuss Measurements

The machine shop division of the American Society of Mechanical Engineers, in co-operation with the Museums of Peaceful Arts, will hold a meeting on measurements at the Engineering Societies building, New York, Oct. 17. An exhibit of measuring devices will illustrate the discussion.

Semifinished

Specifications Continue Heavy —Prices of Sheet Bars, Billets and Slabs Nearing a Test

WHILE current specifications for sheet bars, billets and slabs continue heavy, prices for fourth quarter have not yet sifted down to common levels and not much contracting is noted. Pittsburgh sellers expect $33 for billets and slabs and $34 for sheet bars, while in the valley it is reported billets and slabs are being sold at $34, Pittsburgh or Youngstown.

SEMIFINISHED STEEL PRICES, PAGE 796

Youngstown, O., Sept. 25.—Gradually the semifinished steel market in this district is ironing itself out with additional sales being made, more especially sheet bars to sheet mills. The volume of strictly billet business in the valleys has fallen off slowly but unmistakably in the past several years, and now it divides with slabs in importance. Billets and slabs are being sold here at $34, Pittsburgh or Youngstown, and sheet bars at $33 by two important makers. Wire rods are holding at $42, Pittsburgh or Cleveland.

Philadelphia, Sept. 25.—Several small tonnages of billets were sold in the past week for fourth quarter at $33, base, Pittsburgh, for rerollers, and $38 for forging quality. A good tonnage of wire rods has been booked at $42.

Pittsburgh, Sept. 25.—Specifications for semifinished material are good. Contracting is light. Some mills are requiring considerable of their semifinished steel for finishing operations and are not pushing sales. Sellers look for $33 to be firm on fourth quarter business in rerolling billets and slabs, with some possibility of $34 being maintained on sheet bars. Contracts for wire rods are being taken at $42, Pittsburgh.

Cleveland, Sept. 25.—Specifications for sheet bars, billets and slabs are extending mill backlogs, though the leading merchant producer here is operating at better than what it normally considers 100 per cent. Current prices of sheet bars, billets and slabs are $33, but no definite action has been taken for fourth quarter.

Extends X-Ray Work

Work in the X-ray study of metals will be extended during the coming year at Harvard university, according to a recent announcement. Dr. R. H. Aborn, formerly research associate at Massachusetts Institute of Technology, has been put in charge of X-ray work of the department of metallurgy, Harvard Engineering School, Cambridge, Mass.

Bars

Heavy Specifications Being Filed —New Price Seems Assured— Some Deliveries Are Deferred

CONSUMERS of soft steel bars are specifying their third quarter tonnages more closely than usual and little will remain for cancellation. At Chicago the past week was close to the record week of the year. In that district deliveries are being deferred by heavy bookings. The advance price for fourth quarter seems assured of complete establishment.

BAR PRICES, PAGE 795

Chicago, Sept. 25.—Specifications for bars and other light finished steel products are in heavy volume on expiring third quarter obligations. The rate of actual mill orders runs close to that of the last week in March, which stands as the record seven-day period this year for specifications and sales. For the past four weeks sales have shown little fluctuation and in three of these weeks they approximated those of the final week last March. Farm implement activity, particularly from tractor builders, is making a new autumn record. Support from implement makers and automotive and parts industries is giving life to the present market. Some bar buyers will order out material on present contracts up to Oct. 1, owing to lengthened bar mill schedules, although mills state that so far as their sales departments were concerned the limitation on third quarter specifications was Sept. 10. Deliveries on some sizes and sections of bar mill products have been extended to 30 days.

Rail steel bar makers have announced an advance of $2 per ton to the manufacturing trade, effective immediately. The price for road and bridge work has been advanced to a range of 1.95c to 2.05c, Chicago Heights.

Buffalo, Sept. 25.—All fourth quarter bar business to date has been on a basis of 2.10c, Buffalo, sellers claim. Confidence is expressed by steelworks in their ability to maintain this price. Fourth quarter production schedules will be in line with high operations of the current three months period, it is predicted.

Pittsburgh, Sept. 25.—Fourth quarter contracting for hot rolled bars is slower than usual, but the advance of $2 a ton over third quarter prices seems assured. Specifications still are being received on some contracts that did not carry the Sept. 10 or Sept. 15 deadline. Most users are specifying to the full extent of their contracts to a greater degree than usual. Practically all consuming lines are well represented in current buying, with the automotive industry still an important factor.

Youngstown, O., Sept. 25.—Independent bar mills here, which a month ago were running at 50 per cent, now have gone to 65 per cent. The added volume of new business is coming from a wide variety of consumers who are covering for fourth quarter at the new advanced price of 2.00c, Pittsburgh. Excellence of deliveries checks any tendency of customers to buy very far ahead and there is no evidence of abandonment by consumers of hand-to-mouth buying.

Cleveland, Sept. 25.—Soft steel bar sales tapered off in the past week, as third quarter material has been specified out and most users are deferring the test of fourth quarter prices. Some contracts, however, have been written at $2 per ton over third quarter levels. Pittsburgh district makers quote 1.95c to 2.05c, Cleveland, depending on tonnage. A local maker quotes 1.85c, Cleveland, to large and 1.90c to small buyers, without taking a definite stand on fourth quarter.

Philadelphia, Sept. 25.—The great strength of the steel bar market is a feature. Most orders are priced at 2.00c, Pittsburgh, with 1.95c done in a fair number of cases. On the other hand, 1.90c has been done infrequently and now that certain large buyers have covered on that basis the 1.90c price has practically disappeared. The current range therefore is 1.95c to 2.00c, Pittsburgh.

Offers to Help Europe

New York, Sept. 25.—The American Institute of Steel Construction has cabled the International Congress on Bridge and Structural Engineering, which is convening in Vienna, offering to co-operate on European structures. The institute has offered to make available to the congress the technical data relating to improved engineering practices on steel structures which have been found applicable in the United States.

A meeting of the Atlantic States Shippers' Advisory board has been called for Wilmington, Del., Oct. 4.

Plates

Miscellaneous Orders from Diversified Lines Increasing— Fourth Quarter Needs Active

THE bulk of plate tonnage now going on makers' books represents miscellaneous small-order business. Negotiations for fourth quarter requirements are more active and some orders have been booked at $2 over current prices. About 16,000 tons of plates will be required for oil-tank projects now appearing from western sources at Chicago.

PLATE PRICES, PAGE 795

Pittsburgh, Sept. 25.—Most plate fabricators in this district are well occupied on business booked a short time ago, one interest having sufficient to keep it busy until Jan. 1. A few barge orders continue to be entered, with increased activity in this direction looked for in the near future. Plain material is being specified at a fairly active rate and September tonnage is expected to compare favorably with August. Some current business is moving on third quarter contracts, and fourth quarter tonnage is being booked at an increase of $2 a ton over the old prices.

New York, Sept. 25.—Fourth quarter contracts for plates have been booked at 2.15c, base, Coatesville, equivalent to 2.32½c, delivered, New York. Current orders continue to be accepted this week at 2.05c, base, Coatesville. This figure now seems to be the minimum. Demand again is improving and September tonnage is expected to compare favorably with August. Standard Oil Co. of New Jersey has placed 1000 tons of tank work for erection in Texas with an unstated fabricator. Texas Co. has placed substantial orders for oil storage tanks with Petroleum Iron Works Co.

Cleveland, Sept. 25.—Plate orders are growing in number from diversified lines such as steam shovel manufacturers, boiler and other fabricating shops. Ship and tank building is at a low ebb. Some fourth quarter contracts have been written at as high as 2.00c, Pittsburgh. Larger tonnage users will pay 1.95c, the market generally being $2 per ton higher than for the third quarter.

Two Great Lakes car ferries are pending here, each requiring 2800 tons of plates.

Chicago, Sept. 25.—Plate mills are in a much less advantageous position as to backlogs than bar mills. One producer is scheduling only a week ahead, although operating close to 80 per cent. About 8000 tons will be required for oil tanks that have been

placed but it is understood this tonnage, from the Southwest, may not go on mill books immediately. Fresh inquiry for oil tonnage includes 8000 tons from a Pacific coast refinery. Negotiations for fourth quarter are active. Preferred buyers also must pay $2 a ton higher for material after Oct. 1.

Philadelphia, Sept. 25.—The long projected pipe line from Torresdale to Lardner's Point, Philadelphia, is expected to be submitted for bids in the next week or two. It will require about 8000 tons of plates. Demand for plates generally continues good. Some fourth quarter contracts are being closed. The usual price for fourth quarter now is 2.15c, base, Coatesville, or 2.25c, delivered, Philadelphia, while in certain instances large consumers are able to buy at about $2 less per ton. Until the end of this week mills will continue to accept current specifications at the recently prevailing prices of 2.00c to 2.05c, base, Coatesville.

Beaumont, Tex., Sept. 25.—When the construction program of the Yount-Lee Oil Co. is completed at its tank farm adjacent to Spindle Top and at its deep water loading terminals on the Neches river, it will have a total of 104 steel tanks of 55,000-barrel and 4 of 80,000-barrel capacity. It has just awarded 30 of the smaller type.

Birmingham, Ala., Sept. 25.—Tennessee Coal, Iron & Railroad Co. is building eight more barges for service between Birmingport, on the Warrior river, and various Gulf ports.

CONTRACTS PLACED

3600 tons, 30 oil tanks, 55,000-barrel capacity, Yount-Lee Oil Co., Beaumont, Tex., to Reeves Bros.
175 tons, 54-inch riveted pipe line, Tacoma, Wash., to Steel Tank & Pipe Co.
110 tons, plates and shapes, barge for Kosmos Portland Cement Co., Louisville, Ky., to Dravo Contracting Co., Pittsburgh.
100 tons, plates and shapes, barge for Ruprecht Sand & Materials Co., St. Louis, to Dravo Contracting Co., Pittsburgh.

CONTRACTS PENDING

5600 tons, two Great Lakes car ferries, Cleveland; bids being taken.

August Auto Output Good in Canada

Washington, Sept. 25.—Production of passenger cars and trucks in Canada in August increased to 31,245, compared with 25,226 in July, according to the dominion bureau of statistics. The August total is the second highest this year, May being 2000 higher.

Claude S. Gordon, Claude S. Gordon Co., Chicago, addressed the Indianapolis chapter of the American Society for Steel Treating at its first regular meeting on Sept. 10. "Pyrometry" was his subject.

Pipe

Oil and Gas Line Tonnage Increasing Mill Schedules—Cast Pipe Bookings Decline

MAHONING valley and Pittsburgh district mills begin to schedule gas and oil line pipe business booked some time ago. Valley plants place additional units in operation and operate seamless mills double turn. Cast pipe lettings are fewer in South and fair in Middle West. Chicago inquiries for 2100 tons. Southern foundries advance cast pipe $2 for delivery in New York.

PIPE PRICES, PAGE 796

Pittsburgh, Sept. 25.—Demand for merchant steel pipe is well maintained. The oil industry shows substantial improvement over two months ago, which is reflected in buying of oil and casing pipe, and tubular requirements for drilling purposes. National Tube Co. and Spang, Chalfant & Co. are furnishing 38,100 tons of 10-inch oil line pipe, to be constructed soon by the Cities Service Co. to Augusta, Kans. Specifications have not been received by a Mahoning Valley mill on a contemplated line for the Texas Co. from Oklahoma to Lockport, Ill., involving 40,000 tons. Both of these were awarded some time ago. Lines too are contemplated by the Marland Refining Co., Independent Oil & Gas Co., and Transcontinental Oil Co.

New York, Sept. 25.—Cast pipe demand is comprised largely of small, scattered tonnages for private account. Contractors' bids were opened today on work involving 250 tons for Queens. With the conclusion of the annual meeting of the New England Water Works association, at Montreal, last week, some sellers look for improvement in inquiry from New England cities. No marked improvement is expected, however, until after November elections. One or two southern foundries, with representation here, have announced a $2 advance. However, this only places these foundries at a further disadvantage in this market, as their prices delivered New York now range $45.25 to $46.25 on 6-inch and over, compared with around $37.60, quoted by most northern foundries.

Youngstown, O., Sept. 25.—Large seamless and welded line pipe orders placed recently by oil and natural gas companies in the Southwest now have a place on valley steel and iron pipe mill schedules. This has resulted in livelier pipe mill activities here than in many months. Additional welded units have been placed in operation and seamless units now are operating on double turn. This new business insures operation of certain large size mills well through next December. Meanwhile, merchant pipe also has been booked in comfortable volume, especially for building operations.

Cleveland, Sept. 25.—Orders for standard full weight merchant pipe from jobbers are increasing in number but not in size. Individual lots rarely comprise more than a single carload, or enough at a time to keep stocks in even balance. Building activity is less than last year at this time, and pipe buying is restricted accordingly. Nearby pipe mills are loaded up with oil country goods the remainder of the year. Prices are firm.

Chicago, Sept. 25.—Small lot sales of cast iron pressure pipe are in fair volume, but a definite seasonal slackening in important municipal awards is encountered. Except for an inquiry for 2100 tons of pipe for Chicago, the municipal market is extremely quiet both here and in the Detroit territory. Quotations are on the basis of $34 to $35, base Birmingham, for 6 to 24-inch pipe, but it is indicated lower prices have been submitted on pending work.

Birmingham, Ala., Sept. 25.—Lettings for cast iron pipe have eased off some but production and shipments still are active. Several shops have much tonnage to deliver and will go into the winter season with large backlogs. Quotations are unchanged at $34 to $35 on 6-inch and over. Soil pipe market is unsteady and production is off.

CONTRACTS PLACED

1502 tons, 4 to 18-inch class B, Signal Hill, Calif., to American Cast Iron Pipe Co.
1467 tons, 4 to 10-inch class B, Clearwater, Calif., to American Cast Iron Pipe Co.
949 tons, 8 to 30-inch class C, Denny Hill project, Seattle, to Geo. Nelson & Co.
750 tons, 42-inch pipe for Milwaukee, to United States Cast Iron Pipe & Foundry Co., at $33, Birmingham.
178 tons, 4 to 10-inch class B, improvement of Mountain View drive, San Diego, Calif., to V. R. Dennis Construction Co.

CONTRACTS PENDING

1500 tons, 24 to 30-inch cast pipe, Honolulu, Hawaii.
142 tons, 4 to 14-inch class B, Oxnard, Calif.; bids Sept. 25.

Heads Car Company

Mt. Vernon, Ill., Sept. 25.—Ralph K. Weber has been elected president of the Mt. Vernon Car Mfg. Co., to succeed Walter C. Arthurs, whose death was announced in last

week's issue of IRON TRADE REVIEW. H. H. Cust was named vice president of the Mt. Vernon company.

Bolts, Nuts, Rivets

Fourth Quarter Contracting Well Advanced at Former Price

NUT AND BOLT PRICES, PAGE 796

Chicago, Sept. 25.—Specifications on bolts, nuts and rivets are running slightly below August because some buyers are taking inventory. Farm implement orders are heavier. Contracting for fourth quarter is practically completed, all larger buyers having ordered their usual quarterly obligations. Resistance to prices is practically negligible. Carriage and machine bolts are 60 to 70 off, according to quantity.

Pittsburgh, Sept. 25.—Contracting for bolts, nuts and rivets for fourth quarter is being rapidly completed. Current prices of 60 to 70 off for bolts and nuts and 2.90c for large rivets prevail. Specifications are steady at the early September rate, with slight improvement reported by some interests. Railroad buying still lags. Operations are unchanged at 60 to 65 per cent.

Cleveland, Sept. 25.—Further progress is reported in contracting for nuts and bolts for fourth quarter. Usually 70 off is the figure, although small buyers have paid 60 off. A start also is made on renewals of rivet arrangements at the reaffirmed 2.90c, Cleveland, figure. Tonnages are expected to aggregate slightly less than those of the third quarter. Shipments this month are a trifle under August.

Tin Plate

Specifications in Good Volume—Current Price Continues

TIN PLATE PRICES, PAGE 795

Pittsburgh, Sept. 25.—Tin plate operations are steady at close to 85 per cent. Except canmakers, who have passed the peak of their requirements, most users are specifiying in good volume and more actively than a year ago. Tin plate continues $5.25 per base box, Pittsburgh. Any change in this price will not be made until November.

Railroads Enter Market

New York, Sept. 25.—New York Central railroad has issued inquiries covering its miscellaneous requirements of steel bars, plates, shapes, sheets, billets, axles, pipe, nail, wire and other miscellaneous steel products for fourth quarter. Bids will be opened Oct. 3.

Lehigh Valley railroad also is inquiring for its miscellaneous steel requirements for the fourth quarter.

Sheets

New Discount Terms and Prices Held Firmly—Spot Orders and Specifications Heavy

SHEET mills are adopting an uncompromising attitude on the new terms of sale, and on the new prices on certain grades for fourth quarter. Some important consumers have tried vainly to place tonnage at the new prices, on condition they be given the former discount. In one case the difference in terms means $42,000 additional on the consumer's fourth quarter requirements. Chicago mills have accumulated good backlogs.

SHEET PRICES, PAGE 795

Cleveland, Sept. 25.—Sheetmakers are surprised at the relatively high buying rate maintained by various consuming lines. One producer specializing in the higher finishes states that last Saturday's order mail was the largest of any day in its history. This is true, too, despite its 7-week delivery date. While in some directions automotive demand is declining because of model changes, it is increasing in others and considerable tonnage is being taken for Michigan delivery. Full finished sheets are 4.00c, Pittsburgh. Other prices for the most part are firm for fourth quarter, namely 2.75c for black and 3.50c for galvanized. While one or two users of blue annealed have been able to renew for fourth quarter on a voluntary offer of 1.90c, the usual figure is 2.00c to 2.10c.

Producers are taking an adamant stand against efforts of buyers to obtain either concessions in price or in connection with the new cash discount terms. One large tonnage consumer of full finished sheets has receded half way in his demands and now will purchase for fourth quarter at the 4.00c figure providing the 2 per cent cash discount is extended. All mills thus approached with this compromise gesture have rejected it. One mill has just returned orders involving 1900 tons of black sheets presented to it at 2.65c, Pittsburgh, refusing to grant the $2 concession.

New York, Sept. 25.—A number of mills in the past week have refused to accept attractive specifications for black sheets at 2.65c, base, Pittsburgh, a price which would have been acceptable to them early in September. Remaining traces of old prices now are scarce. Current figures are 2.00c, base, Pittsburgh, for blue annealed, 3.50c for galvanized, 2.75c for black.

St. Louis, Sept. 25.—Producers and distributors of sheets report that the new fourth quarter prices have not had a sufficient test, but thus far there has appeared no strong resistance.

Pittsburgh, Sept. 25.—Sheetmakers report a minimum of opposition in obtaining higher prices for fourth quarter shipment. New business has been booked by large users, including some automotive interests, at 2.75c, Pittsburgh, for sheet mill black, 2.00c for blue annealed, 2.90c for tin mill black, and 3.50c to 3.60c for galvanized. Full finished sheets continue at 4.00c. Specifications showed a slight letup the past week, most contracts having expired on Sept. 15. Operations, however, show no slackening and practically all mills have a substantial backlog on which to work.

Youngstown, O., Sept. 25.—Urgency of sheet consumers for material is driving mills in this district at the rate of 89 per cent of capacity. Incoming business shows no sign of diminishing. Additional users of flat-rolled products continue to accept the new terms and prices for fourth quarter delivery. It is understood that Nash, Chrysler and now Briggs Body, in addition to various General Motors units and others mentioned last week, have begun placing business with the mills on the new sales conditions; although Mullins Body, Salem, O., and Ford Motor continue to seek modifications, so far in vain. In the case of an important consumer, the new terms mean a cost difference of $42,000 for fourth quarter, compared with the same tonnage placed under the old conditions. New prices are taking hold. Common black sheets are 2.75c, Pittsburgh, galvanized 3.60c; blue annealed 2.00c to 2.10c, autobody 4.00c.

Chicago, Sept. 25.—Sheet mills in the Chicago district are acquiring good backlogs. One mill reports the situation the best in seven or eight months. Present activity is the more favorable, considering that automotive business does not comprise a heavy portion of the sheet trade in this territory. Operations are about 85 per cent, having gained 15 to 20 points in three weeks. No spot business can be taken as backlogs in black and galvanized are extended about three weeks, and blue annealed a week to ten days farther. Chicago delivered quotations are 2.90c for No. 24 black, 3.65c for No. 24 galvanized, and 2.15c for No. 10 blue annealed.

Philadelphia, Sept. 25.—September sheet demand is the largest of any month so far this year. Many buyers have specified heavily to take advantage of the 2 per cent discount, soon to be abolished. Mills generally are firm at 2.00c, base, Pittsburgh, for blue annealed, 2.75c for black and 3.50 for galvanized, minimum, while a considerable portion of the small-order business in blue annealed is bringing 2.10c. An extra of $2 applies on blue annealed over 45 inches.

Structural Shapes

Week's Awards Suffer by Comparison With Last Week—Pending Inquiries Fair—New York May Change Building Code

LESS in number as well as in volume than last week, when the aggregate broke all records for three years, structural shape awards this week involve such items as 4500 tons at Toledo, O., 1760 tons at Chicago, 1500 tons at Buffalo and 4200 tons at New York. Pending in the latter territory, however, is a bridge which may eventually involve 25,000 tons. A department store at Minneapolis will require 6000 tons. In general, inquiries hold up well in every district, much work being upon architects' boards. Mill specifications are active in a final spurt of closing out third quarter contracts. Fourth quarter contracting so far is limited. New York may change its building code to increase working stress from 16,000 to 18,000 pounds per square inch.

STRUCTRUAL SHAPE PRICES, PAGE 795

New York, Sept. 25.—The close of this month is expected to see 2.195c, New York, generally quoted as minimum on large lots of structural shapes, with smaller orders running possibly $1 per ton higher. Current local demand has been moderate in view of the upward tendency in prices. Nevertheless, considerable work is in sight, with specifications to be issued Oct. 1 on 20,000 to 25,000 tons for a new bridge between Staten island and New Jersey. This bridge it is said, will be the largest arch type bridge ever attempted.

Mayor Walker will hold a public hearing Sept. 28 before acting on the proposal to change the local building code so as to increase the working stress in structural steel from 16,000 to 18,000 pounds per square inch. This proposal recently was unanimously adopted by the board of aldermen. The ratification of this proposal by the mayor is expected to reduce the cost of steel entering a project by at least 12 per cent and would bring New York in line with practically all other large cities in the United States. According to the American Institute of Steel Construction, Inc., whose standard specificaton provides a basis for the proposed change, it should effect a saving of at least $6,000,000 a year on current buildings in New York alone and by thus reducing the cost of steel, make its usage more general.

Suggestion that the proposed change in the code is contributing materially to what appears to be a temporary lull is discounted by some leading fabricators. Urgency for going ahead, where actual engineering work is fairly underway, makes it impractical in most cases to await action on the code, it is believed. On some projects, notably the proposed Reynolds building, work has been completed with working stresses designed to take advantage of the full allowance provided by the proposed code amendment. In such cases pending action on the code may be contributing materially to delay.

Boston, Sept. 25.—Little was done in the structural line the past week. The only noteworthy award comprised 162 tons for a new store and office building on Washington street.

Philadelphia, Sept. 25.—The shape market reflects a distinct advance although it is too early to report accurately on prices. Mills generally show firmness in quoting 2.05c, Pencoyd or Bethlehem, depending on which takes the lowest freight rate to destination. In other words, the usual figure now named is 2.11c, delivered Philadelphia.

Pittsburgh, Sept. 25.—Specifications for plain structural material still are in good volume, with most fabricators well occupied on old work. Although new awards include few large tonnages, total business aggregates fairly high. Some material still is being specified on contracts that run until the end of this month. Fourth quarter contracting is slow, only a few users signing up at the $2 increase over third quarter prices.

Buffalo, Sept. 25.—More than 2000 tons of new structural business were placed on fabricators' books during the past week, in large and small projects. The structural outlook for the last quarter here is somewhat improved. Prices are reported firm at 2.10c, Buffalo, for last quarter. Bookings and inquiry indicate a good run for the mills during that period.

Cleveland, Sept. 25.—Architects' boards are crowded with structural work being pushed to conclusion. Inquiries are numerous involving small tonnages and a number take worthwhile lots. Specifications against mill contracts are heavy to close out third quarter contracts. Some contracting has been engaged in for fourth quarter and for some of the smaller customers 2.00c, Pittsburgh, has applied.

Chicago, Sept. 25.—Structural fabricating shops specify steadily for plain shapes from the mills, but show no haste to contract for the final quarter. Structural mills are on a lower operating rate than bar mills, and have little forward business at present. Fabricators are maintaining their usual stock sizes but otherwise specify for individual jobs. Mill sales departments have held to the Sept. 10 limit for the accommodation of third quarter specifications, but deferred schedules of some of the structural mills have rearranged specifications so that orders on a 2.00c basis likely will be honored up to Oct. 1.

Birmingham, Ala., Sept. 25.—Virginia Bridge & Iron Co. is providing 600 tons of structural steel for additions to the United States Cast Iron Pipe & Foundry Co. Ingalls Iron Works Co. Inc. has the contract for 300 tons for a carbon bi-sulphide mill. It furnished 2300 tons for the main structure and 600 tons for a power plant for the Gulf States Paper Corp., it will fabricate 100 tons additional and also is building another hangar and a station for the Pan-American Airway Co.

Awards Compared

	Tons
Awards this week	26,800
Awards last week	79,928
Awards two weeks ago	26,282
Awards this week in 1927	27,275
Average weekly awards, Aug.	34,957
Average weekly awards, 1928	38,491
Total awards to date, 1927	1,389,783
Total awards to date, 1928	1,501,156

CONTRACTS PLACED

4500 tons, lift bridge, Toledo Terminal Railroad Co., Toledo, O., to American Bridge Co.

2200 tons, professional building, Eighty-seventh and East End avenue, New York, to Hedden Iron Construction Co.

2000 tons, store, 721 Fifth avenue, New York, to A. E. Norton Inc.

1760 tons, two junior high schools, Chicago, to unstated fabricators.

1500 tons, plant for Bliss & Laughlin Inc., Harvey, Ill., at Buffalo, to Lackawanna Steel Construction Co.

1400 tons, Methodist hospital unit, for Leslie Colvin, Indianapolis, to Insley Mfg. Co.

1040 tons, building for University of Chicago, to Lakeside Bridge & Steel Co.

1000 tons, plant for Tennessee Copper & Chemical Co., Lockland, O., to unnamed fabricator.

900 tons, body plant addition, Nash Motors Co., Milwaukee, to Worden-Allen Co.

900 tons, building, Arkansas Portland Cement Co., Schall, Ark., to Kansas City Structural Steel Co.

700 tons, widening of Park avenue for New York Central railroad, New York, to Phoenix Bridge Co.

700 tons, building, Washington, to Barber & Ross.

650 tons, plant buliding, Ithaca, N. Y., to Kellogg Structural Steel Co.

600 tons, South Park bridge, Morgantown, W. Va., to McClintic-Marshall Co., Pittsburgh.

600 tons, additions to pipe shops of United States Cast Iron Pipe & Foundry Co., North Birmingham, Ala., to Virginia Bridge & Iron Co.

500 tons, plant addition, Siems-Stemble Co., St. Paul, to Minneapolis Steel & Machinery Co.

450 tons, plant building, Eastern Electrolytic Co., Monsento, Ill., to American Bridge Co.
400 tons plant of Evans-Wallower Zinc Co., East St. Louis, Ill., to American Bridge Co.
350 tons, building, Link-Belt Co., Indianapolis, to Insley Mfg. Co.
320 tons, theater building, Anderson, Ind., to Rochester Bridge Co.
300 tons, plant addition, New Departure Mfg. Co., Bristol, Conn., to Berlin Construction Co.
300 tons, state highway bridge, Vermont, to American Bridge Co.
300 tons, building, Emerson-Brantingham Co., Rockford, Ill., to Midland Structural Steel Co.
300 tons, Dupont Old Hickory fayon plant, Nashville, Tenn., for carbon-bisulphide mill, to Ingalls Iron Works Co. Inc.
260 tons, Nazareth academy, Kalamazoo, Mich., to Rochester Bridge Co.
250 tons, building No. 33 for International Harvester Co., Milwaukee, to Lakeside Bridge & Steel Co.
250 tons, building, Central Steel & Wire Co., Chicago, to Reuter Bros.
230 tons, Kalama river state bridge, to unnamed Portland, Oreg., interest.
200 tons, hangar and station, 100 tons each, Pan-American Airway Co., in Florida, to Ingalls Iron Works Co. Inc.
200 tons, building for Mooney Engineering Co., Buffalo, to R. S. McMannus Steel Construction Co., Buffalo.
200 tons, addition to Houdaille Co., Buffalo, to R. S. McMannus Steel Construction Co.
200 tons, Fairoaks garage, Chicago, to Midland Structural Steel Co.
162 tons, store and office building, Washington street, Boston, to New England Structural Co.
160 tons, five additional stories for Madison Square building, Chicago, to Wendnagel & Co.
150 tons, New York Central bridge, Kankakee, Ill., to Mt. Vernon Bridge Works.
150 tons, apartment, Waller and Laguna streets, San Francisco to Golden Gate Iron Works.
140 tons, school, Pontiac, Mich., to Rochester Bridge Co.
123 tons, miscellaneous, including plant Automotive Gear Co., Richmond, Ind., through John W. Mueller Co., general contractor, to Massillon Bridge & Structural Co.
120 tons, viaduct, Lansing, Mich., through Harvis Engineering Co., general contractor, to Massillon Bridge & Structural Co.
120 tons, Coweeman river state bridge, to Pacific Car & Foundry Co.
115 tons, building for Midland Terra Cotta Co., Sixteenth street and Fifty-fourth avenue, Chicago, to Midland Structural Steel Co.
100 tons, special shapes, for Gulf States Paper Corp., Tuscaloosa, Ala., to Ingalls Iron Works Co. Inc.

CONTRACTS PENDING

20,000 to 25,000 tons, bridge over Kill Van Kull, between New Jersey and Staten island, for port authority, New York, specifications to be issued Oct. 1, with opening date likely to be set for six weeks later.
11,500 tons, Subway section 2, route 108, New York; bids Oct. 11.
10,000 to 11,000 tons, Callowhill street building, the Reading Co., Philadelphia.
6000 tons, department store, Minneapolis.
5000 tons, Museum of Fine Arts, Jackson park, Chicago; action on bids postponed 30 days.
4500 tons, building for Pittsburgh Glass Co., Crystal City, Mo.; steel bids asked.
4100 tons, addition, Lakeside hospital, Cleveland; work now going ahead. General contract awarded John Gill & Sons.
4000 tons, second unit, Strawbridge & Clothier store, Philadelphia.
2500 tons, government printing office, Washington.
2000 tons, bridge work for Wisconsin.
1850 tons, store and garage building, Milwaukee.
1543 tons, One Hundred and Twenty-Fourth Field Artillery armory, Washington park, Chicago; Mississippi Valley Structural Steel Co. low bidder at $110,700, or $71.61 a ton, delivered. Other bids were American Bridge Co., $119,800; Midland Structural Steel Co., $123,886; and Duffin Iron Works, $124,500.
1500 to 2000 tons, power plant for Great Western Power Co., Indian Basin, San Francisco. Bids taken.
1000 tons, 12-story law building, St. Johns, college, Brooklyn.
900 tons, dam project, Hastings, Nebr.
700 tons, New York state bridges.
500 tons, Schroeder & Koppel apartment, Second avenue and Twenty-first street, New York.
500 tons, Arlington memorial bridge, Washington.
500 tons, addition, Eaton Axle & Spring Co., Cleveland; bids close Sept. 26.
500 tons, addition, St. Luke's hospital, Cleveland; Lundoff-Bicknell Co., general contractor, taking revised bids.
450 tons, addition, W. S. Tyler Co., Cleveland. Bids in.
450 tons, Sand Point hangar, Seattle; general contract to Western Construction Co.
400 tons, Social Science building, University of Chicago, Chicago; bids Oct. 3.
400 tons, Zembo temple, Harrisburg, Pa.
300 tons, state highway bridge, Maine.
250 tons, bus terminal and garage, Ontario Street Land Co., Cleveland; general contract to Vokes Construction Co.
150 tons, building, Gears & Forgings, Inc., Cleveland. Bids taken. Carter-Richards Co., architect.
124 tons, Cashmere bridge, Wenatchee river; general contract to Henry Hagman, Wenatchee, Wash.
Unstated tonnage, building, Belle Telephone Co., Broadway, Cleveland; plans underway.
Unstated tonnage, nurses home, Youngstown Hospital association, Youngstown, O.; general contract to J. Bucheit & Son.
Unstated tonnage, 8-story and basement extension to government printing office, Washington; bids close Oct. 15.

Concrete Bars

Higher Figures Immediately Contemplated for Fourth Quarter Push Pending Work

INAUGURATION of higher prices for fourth quarter concrete bars, both billet rolled and rail steel, is culminating in closing a large amount of pending work. Highway construction in New Jersey takes 1150 tons. Subway work in New York requires 400 tons. Several buildings in the Pittsburgh territory take 500 tons apiece. Cleveland jobs are to be let this week.

REINFORCING BAR PRICES, PAGE 795

New York, Sept. 25.—Orders for 1150 tons for highway construction in New Jersey, 550 tons for a building in Brooklyn and 400 tons for subway construction in New York feature the concrete reinforcing bar market. Considerable work continues under negotiation for early action. Prices now generally have been established at 2.25c, base, Pittsburgh, for mill shipments in cut lengths. This is equivalent to 2.59c, delivered New York. On mill shipments in mill lengths of 40, 50 and 60 feet, the price is 2.00c, base, Pittsburgh or 2.34c, delivered New York. Concrete bars out of local stocks continue 2.80c to 3.24c, base, delivered locally, depending on size of order, but a $2 advance in October is intimated to bring the warehouse prices here in line with the recently advanced prices on mill shipments.

Boston, Sept. 25.—The 175 tons of reinforcing bars for a baggage room for the Boston & Maine railroad have been placed with the Concrete Steel Co. About 150 tons in odd lots have been awarded. The 225 tons for the state hospital at Waltham will be placed soon.

Pittsburgh, Sept. 25.—Buyers of concrete bars have been active lately in closing on tonnages carrying old prices. On new business, producers are firm at 2.25c, Pittsburgh, on cut lengths and 2.00c on stock lengths of billet bars. New inquiry is fairly active and the number of jobs in prospect assures a steady demand for the next month. Recent awards include 375 and 520 tons.

Cleveland, Sept. 25.—Concrete bar sellers are clearing the decks for the $2 advance effective Oct. 1. All outstanding quotations must be closed up by the end of this month or they then will be withdrawn. Recent awards have been confined to small lots but action on larger tonnages will take place this week. The new price on cut lengths billet rolled bars will be 2.25c, Pittsburgh, or 2.44c, Cleveland. Rail steel bars have been advanced $2, effective immediately, going to 1.85c, mill.

Chicago, Sept. 25.—Effective Oct. 1, rail steel reinforcing bars will be advanced $2 a ton to 2.10c for larger orders, ranging to 2.80c for small lots. Fresh awards have been scarce, particularly in lots of over 100 tons, but fabricators are well occupied with work placed during the late summer months. Billet reinforcing bar fabricators are slow to contract with the mills for fourth quarter, few obligations having been made for that period. Reinforcing bar quotations continue at 2.30c to 3.00c, depending upon sizes ordered.

Awards Compared

	Tons
Awards this week	6,190
Awards last week	3,363
Awards two weeks ago	3,895
Awards this week in 1927	7,670
Average weekly awards, Aug.	5,863
Average weekly awards, 1928	6,715
Total awards to date, 1927	215,175
Total awards to date, 1928	263,883

CONTRACTS PLACED

550 tons, building for Brooklyn Ash Removal Co., Brooklyn, N. Y., to McClintic-Marshall Co.
540 tons, Veterans' hospital, Alexandria, La., to Jones & Laughlin Steel Corp.
520 tons, West high school, Erie, Pa., to Truscon Steel Co.
500 tons for ocean boulevard for ocean and Monmouth counties, New Jersey, to Truscon Steel Co.
500 tons, Logan street viaduct, Lansing, Mich., to Capitol Steel Co., Lansing, Mich.

400 tons for roadwork in New Jersey, to Igoe Bros.
400 tons for subway construction in New York, to Fireproof Products Co., through La Rocca Construction Co.
390 tons, apartment, 2430 Ocean View avenue, Los Angeles, to unstated company.
375 tons, sewer work, Pittsburgh, through Mike Mannella, general contractor, to Carlem Engineering Co.
325 tons, hotel at Twelfth and Olive streets, St. Louis, to Missouri Rolling Mill Co.
250 tons for roadwork in New Jersey, to Concrete Steel Co.
200 tons, building in Jersey City, N. J., to Jos. T. Ryerson & Son Inc., through Public Service Production Co.
200 tons, plant for Simmons Bed Co., San Francisco, to Pacific Coast Steel Co.
175 tons, baggage room for Boston & Maine railroad station, Boston, to Concrete Steel Co.
175 tons, orphanage, Chicago, to Barton Spider-Web System Inc.
140 tons for Public Service Corn. of New Jersey, distribution station at New Brunswick, N. J., to Igoe Bros.
130 tons, club on South Los Angeles street, Los Angeles, to unstated company.
110 tons, addition to Firlands hospital and apartment house, Seattle, to Pacific Coast Steel Co.
110 tons for building for Suffolk Title & Guarantee Co., Jamaica, N. Y., to Carroll-McCreery & Co. Inc.
100 tons, plant, the Evans-Wallover Zinc Co., East St. Louis, Ill., to Laclede Steel Co.
100 tons, school and apartment building, Chicago, to Concrete Steel Co.

CONTRACTS PENDING

1142 tons, two Junior high schools, Chicago, 571 tons each; Thorgersen & Ericksen Co., contractors.
1000 to 3000 tons, Callowhill street building, the Reading Co., Philadelphia, depending upon whether concrete or steel design is adopted.
1000 tons, Lakeside hospital addition, Cleveland; general contract awarded John Gill & Sons.
575 tons, Fort Lewis barracks, Seattle; bids in.
525 tons, Bernal Cut project, San Francisco; bids opened.
445 tons, addition, W. S. Tyler Co., Cleveland; general contract to be awarded this week.
350 tons, ne Hundred and Twenty-fourth Field Artillery armory, Washington Park, Chicago; Great Lakes Construction Co. low bidder on general contract.
225 tons, hotel, Santa Cruz, Calif; bids received.
200 tons, St. Luke's hospital addition, Cleveland; bids to be taken.
200 to 300 tons, Ohio state highway letting; bids opened Sept. 28.
190 tons, apartment, Chestnut street, San Francisco; bids being received.
170 tons, apartment, Pacific street, San Francisco; bids being received.
140 tons, office building, Fourteenth street, Oakland, Calif.; bids being received.
110 tons, Dawnland hospital, Seattle; bids in.
100 tons, Ballard Methodist hospital, Seattle; bids in.
Unstated tonnage, store and office building, Bing Furniture Co., Cleveland; bids in.

Merchandising Problems To Be Discussed

Problems of merchandising and standardization of steel products will be the chief subjects for discussion at the sixth annual convention of the American Institute of Steel Construction Inc., to be held at the Edgewater Gulf hotel, Biloxi-Gulfport, Miss., Nov. 13-17. Technical subjects such as welding, fireproofing of steel, bridge design and the application of steel joists to structural steel buildings will be discussed. Another outstanding feature of the convention will be the reports of the field engineers whom the institute sent out during the past year for the purpose of assisting in broadening the market for structural steel.

Rails, Cars

Railroads Order Large Rail Tonnages—Car Buying Lags—20 Locomotives Placed

DISTRIBUTION of rail orders approaching a 200,000-ton aggregate affords much encouragement to mills, particularly in the West where the bulk will be rolled. Larger orders are expected soon from New York Central and Pennsylvania. Car buying lags in New York but is expected to develop in Chicago by January. Canadian National has bought 20 locomotives.

RAILROAD TRACK PRICES, PAGE 796

Chicago, Sept. 25.—Activity in the standard steel rail market is growing. Purchases totaled slightly more than 100,000 tons, including 45,500 tons for the Chesapeake & Ohio, 15,000 tons for the Great Northern, and 40,000 tons for the Northern Pacific. About 70 or 75 per cent of this tonnage will be rolled by western mills. It is understood that Illinois Steel Co. and Inland Steel Co. shared equally in the Chesapeake & Ohio tonnage that will go west. In addition to this tonnage it is understood Chicago, Burlington & Quincy will place 30,000 tons soon. Colorado & Southern has placed 5200 tons with a Colorado rail mill. Of the tonnage placed on mill books during the week 15,000 tons is for early shipment, the remainder of the 100,000 tons to be delivered in November, December, and the first quarter of 1929. Rail mill schedules are advanced farther, but operations have not been increased and are continuing at about 50 per cent for the district. Orders for light rails are in miscellaneous lots, the coal wage settlement in Illinois having had little effect on this market.

Sales of track fastenings were in miscellaneous lots. Orders totaled between 2000 and 3000 tons.

While hopes are entertained that buying of car equipment by the railroads will develop into a definite movement by the latter part of this year or early next January, no definite word has come from roads or car building shops. Car builders are doing little except occasional repair work for the roads, and steel mill specifications the past several weeks have been averaging only about 1000 tons weekly from that source.

New York, Sept. 25.—Freight car orders have been negligible, with little fresh inquiry noted. Due principally to the placing of 1000 cars by the Great Northern, the month's showing thus far of around 1225, is almost double the total for last month, but general interest, particularly in this district, appears to be lacking. Current locomotive buying was featured by the placing of 20 by the Canadian National, with 35 yet to be awarded.

The National railway is reported to have purchased 10 locomotives from the Boston & Albany railroad.

Pending freight car inquiry involves but 150, possibly the lowest amount this year. Passenger cars pending number only 15. Approximately 1400 freight cars have been awarded so far this month.

Pittsburgh, Sept. 25.—Small-lot demand for track accessories is fairly active, the tonnage so far this month comparing favorably with that of August. Inquiries from large buyers, however, are few. Demand for light rails continues slow and below the rate of a month ago. While one railroad has booked its fourth quarter requirements of spikes, this practice so far is not common.

Birmingham, Ala., Sept. 25.—The nessee Coal, Iron & Railroad Co. has booked 60,000 tons of rails for the Louisville & Nashville railroad for delivery beginning with the fourth quarter. The Tennessee company is building 250 cars at its Fairfield works for the Southern Pacific railroad.

Birmingham, Ala., Sept. 24.—The Virginia Bridge & Iron Co. has completed shipment of 250 underframes to Memphis, Tenn., shops of the Frisco railroad.

CAR ORDERS PLACED

American Oil Co., Baltimore, two tank cars, to General-American Tank Car Corp.
Maryland & Pennsylvania, one rail motor car, to St. Louis Car Co., power unit to be supplied by Electro-Motive Co.
Northern Pacific railroad, 5 motor coaches and 5 tractor coaches to unstated builder.
Pittsburgh & Shawmut, four caboose cars, to Pressed Steel Car Co.
Sanitary District of Chicago, 20 dump cars, to Magor Car Corp.
Western Maryland, 150 gondola bodies, to Bethlehem Steel Co.
Tonopah & Tidewater, one rail motor car, to St. Louis Car Co., with power plant to be furnished by Electro-Motive Co.

LOCOMOTIVES PLACED

Canadian National, 20 passenger locomotives, to Montreal Locomotive Works; 35 still pending.

LOCOMOTIVES PENDING

Central railroad of Vermont, two locomotives.
Denver & Rio Grande, 10 locomotives.

CAR ORDERS PENDING

Central railroad of Vermont, 500 automobile cars.
Denver & Salt Lake, one business car.

Mine production of copper in Arizona in 1927 was 682,190,547 pounds.

Strip

Large Users of Hot Rolled Strip Given Former Price—Cold Rolled Prices Firm

HOT rolled strip users, whose tonnages are attractive to producers, are covering fourth quarter needs at the same price as for third quarter. Smaller users are paying a higher figure. Narrow widths are stronger than wider. Specifications are large and some mills have the largest backlogs of the year. Automotive buying leads other industries.

STRIP PRICES, PAGE 796

New York, Sept. 25.—The feature of the hot rolled strip steel market is the firmer tendency in prices on narrow widths. Some buyers of attractive tonnages have signed for fourth quarter at $2 a ton over third quarter. In quite a few cases 2.10c, base, Pittsburgh, is applied in these contracts to all widths under 6 inches, while in some the prices are 2.00c, base, Pittsburgh, for 3 to 6-inch widths and 2.10c for widths under 3 inches. On wider material, 6 to 12 inches, the price in many cases has been 1.80c for fourth quarter. In a few instances fourth quarter has been entered at third quarter prices, 1.75c to 1.80c, 1.90c and 2.00c, base, Pittsburgh, depending on the widths. With the largest buyers however, there is tendency to get away from these low prices. The current market is regarded as 1.80c to 1.90c, base, Pittsburgh, for 6 to 12-inch, 2.00c to 2.10c for 3 to 6-inch and 2.10c to 2.20c for less than 3-inch. From a general standpoint, indications are the mills will get somewhat higher shipping prices on hot rolled strip steel during fourth quarter than third. While large consumers will pay the same as during third quarter, most buyers will pay $1 to $2 a ton higher.

Pittsburgh, Sept. 25.—Though a number of large users of hot rolled strip booked fourth quarter requirements at third quarter prices, a number of consumers have signed at advanced figures, 2.20c for sizes under 3-inch, 2.10c for 3 to 6-inch, and 1.90c for 6 to 12-inch. Specifications have shown no slackening recently, and backlogs of some mills are the largest this year. One interest reports the biggest volume of unfilled business since 1925. A large portion of current buying is by the automotive industry. On cold rolled strip, 2.75c is the minimum on fourth quarter tonnage and some smaller users have contracted at 2.85c. Sellers quote 3.00c to 2.10c on cold strip of less than 3 tons.

Cleveland, Sept. 25.—Orders for both hot and cold strips continue numerous and bookings have equipped makers with good backlogs. Most deliveries on hot strips are three to four weeks deferred but first week in November datings already are named in cold rolled. While in hot, fourth quarter extensions have been granted at third quarter prices—1.85c to 1.90c for the wide, 2.00c for the intermediate and 2.10c for the narrow—some effort still is being made to obtain advances of $1 or $2 per ton. Cold strips are generally 2.85c for fourth quarter, although a few buyers have been protected for at least two weeks in October at 2.75c. Fender stock is firm at 4.25c. Rejections are numerous.

Mine production of gold in Arizona in 1927 was 200,494.50 fine ounces.

Cold Finished Steel

Resistance to New Prices Is Encountered by Makers

COLD FINISHED PRICES, PAGE 795

Pittsburgh, Sept. 25.—Sustained operating rates among automobile builders is a factor in the steady demand for cold finished steel. Contracting for fourth quarter at 2.20c, Pittsburgh, is fairly active and although some slight opposition is arising to the new price, a number of large consumers have signed at this figure. September tonnage is expected to equal or better that of August.

Cleveland, Sept. 25.—While some smaller users of cold finished bars have contracted for fourth quarter at the new figures, large tonnage consumers hold off. Many have specified so heavily for third quarter they will not need additional material for three or four weeks. August-September shipments in some cases will reach a new high 2-month total for that period. The market is 2.25c, Cleveland.

Wire

Fourth Quarter Contracting Steady at Current Prices—Specifications Are in Larger Volume

CONSUMERS of wire and nails are contracting for fourth quarter in good volume though some tendency to delay is noted. Tonnage on mill books is growing and production is being increased somewhat. Nail prices are less steady and competition is keen. Lower price on one large automotive sale has not disturbed the market generally. Most stocks are large.

WIRE PRICES, PAGE 796

Chicago, Sept. 25.—Fourth quarter contracts for wire products are being placed steadily. Jobbers' support is becoming more of a factor. Tonnage is steadily accumulating on mill books and indications are for good fall activity. Stocks of nails and plain wire still are large and consequently mill operations for these products have not been increased. Other departments have passed 70 to 75 per cent rate of operations. Mills say prices are holding well at $2.60, Chicago or western mills, for nails, and 2.45c for bright plain wire.

Worcester, Mass., Sept. 25.—Demand for wire continues to improve and covers a broader range. Prices are steady and apparently established at 2.55c for plain wire, Worcester base, for fourth quarter business.

Philadelphia, Sept. 25.—Fair sales of wire and nails for fourth quarter have been made at unchanged prices of 2.40c, Pittsburgh, for plain wire and $2.55 for nails, plus $2 per ton to dealers. Mills report specifications slower than last year.

Buffalo, Sept. 25.—Wire makers report good specifications from automobile manufacturers and are operating at about 80 per cent. Wire prices for last quarter are firm.

Pittsburgh, Sept. 25.—Steel wire producers are firm in asking 2.40c for plain wire and $2.55 for wire nails on fourth quarter contracts. Contracting is fairly active although there is a tendency on the part of some large users to hold off. Specifications in the meantime are in substantial volume, and the September tonnage is expected to show an increase over that of August. Some jobber buying for stock is noted although consumers generally are ordering only for current requirements. Demand for wire products for agricultural purposes is expanding.

Cleveland, Sept. 25.—Despite uncovering of a 2.30c, Pittsburgh, price on plain wire to a large Michigan automotive interest, regular wire buyers are renewing for fourth quarter at 2.40c. Keen competition is encountered in some directions on nails, one buyer claiming to have bought a carload at less than $2.50 from other than an Ohio river mill. Large producers, however, are refusing less than $2.55.

Nonferrous Metals

Activity in Copper Features—Consumers Fill Early Requirements and Prompt Metal Commands Premium

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New Spot	York Futures	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Sept. 19	15.00	15.12½	14.55	48.00	47.37½	6.50	6.30	6.25	23.90	10.87½	35.00
Sept. 20	15.00	15.12½	14.55	48.00	47.37½	6.50	6.32½	6.25	23.90	10.75	35.00
Sept. 21	15.12½	15.25	14.75	48.75	48.12½	6.50	6.32½	6.25	23.90	10.37½	35.00
Sept. 24	15.25	15.37½	14.75	49.00	48.00	6.50	6.32½	6.25	23.90	10.37½	35.00
Sept. 25	15.25	15.37½	14.75	48.62½	48.12½	6.50	6.32½	6.25	23.90	11.00	35.00

NEW YORK, Sept. 25.—Spectacular activity in copper featured the nonferrous metal market during the past week. Prices were extremely strong throughout the list of metals and in several lines were advanced. The most notable increase was on copper, but lead also went up and so did tin.

Copper—Heavy demand for metal encountered during recent weeks has continued and with it prices have advanced ½-cent during the past ten days. Today copper is quoted at 15.25c, Connecticut, the highest level in several years. It is estimated that close to 90 per cent of consumers' requirements for November have been covered, and as September-October metal is extremely scarce any lots available for this delivery command a premium. Both domestic and export demand has been heavy.

With the increase in the price of copper, brass product prices also have been advanced and today these are based on copper at 15.25c, Connecticut. Demand for products has been extremely heavy and producers have been forced to push deliveries back.

Zinc—Aside from a curtailment in ore production the zinc market has been quiet. It is expected that with a cut in the ore supply that the market will be supported in the face of a rather slow demand for metal. At 6.25c, East St. Louis, the market appears to be pegged at the moment although talk of higher prices is heard.

Lead—Fair demand was encountered all week. Many buyers came into the market to cover their October requirements, and in view of the $2 a ton increase effected in price some consumers deemed it advisable to protect themselves still further ahead. Total sales for the week are said to have exceeded in volume the contracts placed during any week of the year to date.

Tin—Some speculative bidding during the week caused a slight fluctuation in prices, but the tendency of the market has been steadily upward. Heavy consumption is keeping fairly well up to large production. Both dealers and consumers have bought metal lately.

Antimony—Little of interest developed in this market during the week. A few sales were made but not a great deal of interest was noted. Prices held fairly steady.

Aluminum—Prices are steady with a fair volume of new business coming in and shipments on old orders being pushed as rapidly as possible.—*Daily Metal Trade.*

Coke By-Products

Spot Benzol Difficult to Get—Xylol Benefits—Sulphate Quiet

New York, Sept. 25.—Due to heavy demand for motor fuel and a highly active industrial consumption, benzol is in the tightest position in months. Nowhere throughout the country, so it appears, is it possible to obtain a tank load of benzol within two weeks time and in some sections further time is required. Sellers see no indications of a letup in buying. However, they do not look for a price advance, unless the present situation should continue another 45 to 60 days.

No slackening of interest is noted in toluol, for many weeks in great demand, particularly by paint and lacquer manufacturers. Some leading sellers have already contracted for their October production. Nevertheless, prices are unchanged.

Due to scarcity of toluol, demand for commercial xylol has been stimulated, placing this material firmly at 30 cents, works, for material in tank lots and 35 cents in drums. Solvent naphtha in turn has been influenced by the strength in commercial xylol, with prices also fairly steady.

Ball and flake naphthalene is undergoing seasonal dullness, with prices nominally unchanged. Sulphate of ammonia is moving against back contracts at $2.20, delivered. Spot demand, both domestic and foreign, is quiet.

Mill Products

Base prices cents per pound f.o.b. mill

SHEETS	
Yellow brass (high)	19.75
Copper, hot rolled	24.00
Lead, full sheets (cut ¼c more)	10.00
Zinc sheet (100-pound base)	9.75
Zinc strip (100 pound base)	9.00
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBES	
Yellow brass (high)	24.62½
Copper	25.50
RODS	
Yellow brass (high, full turnings)	17.50
Naval brass	20.25
WIRE	
Copper, car lots	16.87½
Yellow brass (high)	20.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.75 to 10.00
Chicago	9.25 to 9.50
Cleveland	10.50 to 10.75
HEAVY YELLOW BRASS	
Chicago	7.00 to 7.25
Cleveland	7.75 to 8.00
ZINC	
New York	3.50
Cleveland	3.25
HEAVY COPPER AND WIRE	
New York	12.50
Boston	11.50 to 12.00
Chicago	11.50 to 12.00
Cleveland	12.50 to 12.75
RED BRASS BORINGS	
New York	8.75 to 9.00
YELLOW BRASS TUBING	
Cleveland	8.00 to 8.50
LIGHT COPPER	
New York	11.00
Chicago	10.25 to 10.50
Cleveland	11.25
LIGHT BRASS	
Boston	5.75 to 6.00
Chicago	6.25 to 6.75
Cleveland	6.00 to 6.25
ALUMINUM	
Clippings, Cleveland	17.50 to 18.00
Borings, Cleveland	8.50 to 9.00
Cast, Cleveland	12.50
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt Aluminum No. 12	15.00 to 15.50
Brass ingot, 85-5-5	13.00

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.22	.....
90 per cent benzol	0.22	.....
Toluol	0.35	.....
Solvent naphtha	0.30	.....
Commercial xylol	0.30	.....
Per Pound at Producer's Plants in 250-Pound Drums		
Phenol	0.17	.....
Per Pound at Producers' Plants		
Naphthalene flakes	0.06 to 0.07	
Naphthalene balls	0.06 to 0.07	
Per 100 Pounds Delivered		
Sulphate of ammonia	$2.20	

Accept Union Standards

Washington, Sept. 25.—At a conference under auspices of commercial standards unit, bureau of standards, approval was given to commercial standards for malleable iron or steel screwed unions for use in standard weight pipe. The proposed standard was presented by R. E. Bryant, Jefferson Union Co., Lockport, N. Y.

Warehouse

September Demand Probably Will Exceed August—Eastern Jobbers Selling Sheets for Work in Porto Rico—Prices Firm

MIDDLE western jobbers are enjoying good steel demand from buyers unable to wait for mill deliveries. Much building steel is wanted for structures to be completed before cold weather. Prices generally are unchanged but firm.

New York—Jobbing demand is gaining momentum. The month's business will probably exceed August. Improvement lies in the general increase in activities at metal-working shops. A feature of export buying out of local warehouses is demand from Porto Rico for galvanized sheets.

Buffalo.—Warehouses have had another good week. Brisk demand continues for all products. Small structural shapes and galvanized sheets move particularly well.

Pittsburgh.—The September volume shows an increase over the tonnage a month ago. Although this upturn largely is seasonal demand is substantially heavier than a year ago. Prices are steady and except sheets, recent mill advances may not be reflected since jobbers did not follow previous mill declines.

Cleveland—Contractors and builders are increasing most of their orders to warehouses as owners want work rushed to completion before cold weather. More specifications also are developing from diversified lines of consumption where buyers, in receipt of more orders themselves, are unable to await three to five weeks for mill deliveries.

Chicago.—Warehouse buying picks up steadily. Customers are taking a heavy volume of bars. Sheets are more active. The threat of a strike of railroad trainmen on 55 western roads has caused but slight concern.

Cincinnati.—Warehouse operations, which quickened materially around Sept. 1, have slackened. Advances in mill prices seem to have changed the current of the buying, sending it to the mills.

St. Louis—General demand is steady. Sheets, particularly galvanized, are active. Material for use in the rural areas is moving well. Purchasing by the general manufacturing trade has been better. Price trend is firm.

Philadelphia—Quantity extras recently applied to shapes and plates out of jobbers' stocks are based on quantity per section in shapes and quantity per thickness in plates, irrespective of size. Quantity differentials themselves are exactly the same as have prevailed since early this year on bars. These extras are being observed generally in this territory. Business is only fair.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles	3.30c
New York†††‡‡	3.25c
Philadelphia*	2.70c
Pittsburgh	2.90c
Portland	2.50c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.50c
New York‡‡	2.80c to 3.24c
Philadelphia*	2.70c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.25c to 3.00c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.80c to 3.24c
Philadelphia	2.85c
Pittsburgh	2.75c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡‡	3.25c to 3.30c
Philadelphia	2.60c to 3.00c
Pittsburgh	3.00c
Portland	2.90c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia	2.60c to 3.00c
Phila., 3/16-in.	2.80c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

No. 10 BLUE ANNEALED

Baltimore	3.45c
Boston, 3/16-in.	3.915c
Buffalo	3.70c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.90c
Portland	3.75c
Philadelphia*†	3.15c
Pittsburgh**	3.00c to 3.10c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.54c

No. 24 BLACK SHEETS

Baltimore	3.10c to 4.00c
Boston	5.00c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.40c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York†††	3.70c to 3.80c
Philadelphia*†	3.85c
Pittsburgh‡	3.50c to 3.55c
Portland	4.90c
San Francisco	4.95c
Seattle	5.00c
St. Louis	4.10c
St. Paul	3.95c
Tulsa	4.34c

No. 24 GALVANIZED SHEETS

Baltimore	4.10c to 4.75c
Boston	5.85c
Buffalo	4.70c to 5.05c
Chicago	4.65c
Cincinnati	4.75c
Cleveland	4.25c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York†††	4.25c to 4.50c
Philadelphia*†	4.60c
Pittsburgh‡	4.40c
Portland	5.50c
San Francisco	5.40c
Seattle	5.50c
St. Louis	4.95c
St. Paul	4.90c
Tulsa	6.50c

BANDS

Baltimore	3.85c
Boston	4.015c to 5.00c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	4.00c
Philadelphia*	3.25c
Pittsburgh	3.60c
Portland	3.75c
San Francisco	4.10c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.50c to 4.86c

HOOPS

Baltimore		4.00c
Boston	5.50c	6.00c
Buffalo		4.05c
Chicago		4.15c
Cincinnati		4.25c
Cleveland		3.65c
Detroit		4.15c
New York‡‡		4.50c
Philadelphia*		3.50c
Pittsburgh		4.50c
Seattle		5.00c
St. Paul		4.40c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore	3.35c	3.85c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.35c	3.85c
Pittsburgh	3.60c	4.10c
Portland (a)	4.75c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a))	3.85c	.....
Tulsa	4.76c	5.26c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.00c

(b) Net base, straightening, cutting, boxing 1 ton or more. (c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c

Flats and Squares

Baltimore, New York, Phila.	6.00c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. ‡10 to 24 bundles. **25 or more sheets. *†50 or more bundles. †††Newark-Jersey City 4.00c on black and 4.70c on galvanized the more prevalent figures.

Pacific Coast

Quiet Prevails with Steady Buying—Storage Tank Inquiries Exciting Interest

ACTUAL tonnages placed on the coast the past week have been small but a steady flow of business is maintained. Pending projects promise considerable tonnage soon. Tank inquiries are still before the trade and call for a heavy tonnage of plates. Prices are steady. In some branches of industry quickening of demand has appeared.

San Francisco, Sept. 22.—(*By Air Mail*)—Demand for iron and steel products continues though bookings this week, except in cast iron pipe, were limited to a few large tonnages. Interest continues centered around inquiries of various oil companies for storage tanks involving over 10,000 tons of plate material. New inquiries include 2000 tons for a power plant for the Great Western Power Co., San Francisco and 1200 tons of plates for a pipe line at Hood River, Oreg.

Pig Iron and Coke

In foundry pig iron and coke sales and inquiries are limited to small lots. Foundry operations by jobbing foundries have shown no improvement during the past four weeks, though specialty shops, such as sanitary ware and stove foundries are operating on fairly full schedules. Prices are unchanged.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Concrete bar awards totaled 1148 tons. Lettings included 390 tons for an apartment on Ocean View avenue, Los Angeles, booked by an unknown interest and 200 tons for the Simmons Bed Co. plant in San Francisco awarded to the Pacific Coast Steel Co. Pending business exceeds 8000 tons and includes 575 tons for buildings at Fort Lewis, Wash., 525 tons for the Bernal cut project, San Francisco, and 500 tons for a power plant in San Francisco for the Great Western Power Co. Prices continue around 1.80c base on out-of-stock material both in Los Angeles and San Francisco.

Only one plate award of importance was placed during the week. This involved 175 tons for a 54-inch welded pipe line for Tacoma, Wash., and was taken by the Steel Tank & Pipe Co. Bids will be opened Oct. 10 for 1200 tons for a pipe line at Hood River, Oreg. No action has been taken by either the Shell Oil Co. or the General Petroleum Corp., on their inquiries for 15 and 14 storage tanks, respectively, involving over 9500 tons. Plate prices continue at 2.20c to 2.25c c.i.f.

Structural shape awards this week are confined to small lots with one exception. An apartment in San Francisco, on Waller street, was placed with the Golden Gate Iron Works and involved 150 tons. A large volume of business is pending, the total being well above 15,000 tons. Bids are now being taken on 1500 to 2000 tons for a power plant for the Great Western Power Co. at India Basin, San Francisco. Plain material continues firm at 2.35c c.i.f. coast ports.

Other Finished Material

Some important cast iron pipe tonnages were placed this week and the total involved was the largest in over four months, 4223 tons. Lettings included 1502 tons for Signal Hill and 1467 tons for Clearwater, Calif., placed with the American Cast Iron Pipe Co., and 949 tons for Seattle, awarded to Geo. Nelson & Co. Pending business is limited, only one new inquiry coming up for figures during the week. This calls for 142 tons for Oxnard, Calif. Steel pipe is beginning to move in larger quantities and demand for oil country goods and well casing continues active in the southern part of the state.

Seattle Sales Small

Seattle, Sept. 19.—Awards of steel tonnages in the Pacific Northwest this week were limited but several large jobs are pending. Prices are firm. General business conditions are satisfactory. Increased demand for out-of-stock steel is developing in the agricultural sections. Logging camps are resuming operations and business is improving.

Pig Iron and Coke

Despite a recent strike of molders, the foundry business is more active. The strike was caused by a demand for an increase in minimum wages from $6.40 to $7.50. Foundrymen refused the increase as a whole but they have re-employed desirable men, giving them the higher minimum. The strike has not hampered operations and work is proceeding on the open shop basis. The usual fall run of work is being placed and shops report greater capacity in operation. No. 1 Columbia is $26 and $26.50 and Burn at $25. Limited tonnages are being purchased. Coke is being purchased as needed, Tyneside selling at $13.25 and Victoria at $13.50. Nearly all the plants in this territory are using British coke.

Bars, Plates and Shapes

The market is firm and steady, bars and shapes at 2.35c and plates on a basis of 2.25c. Steel mills report unchanged operations although no large tonnages of reinforcing have been recently placed. There is a good run of orders in carload lots. This week Pacific Coast Steel Co. took 75 tons for an apartment at Belmont avenue and Howell street and 35 tons of reinforcing for an addition to Firlands hospital. Northwest Steel Rolling Mills booked 30 tons for the improvements at Sand Point. Business pending includes 575 tons for the Fort Lewis barracks, 110 tons for the Dawnland hospital and 100 tons for the Ballard Methodist church.

There are no inquiries involving large tonnages of plates. Plans are not yet completed for a five-mile, 40-inch steel water main and a 9½-foot concrete lined tunnel proposed by the Seattle water department. Jobbers report a fair volume of business in light gage plates for boiler and tank work.

Awards of structurals this week totaled 350 tons, of which 230 tons for the Kalama river state bridge went to an unnamed Portland interest and 120 tons for the Coweeman state bridge was booked by the Pacific Car & Foundry Co., Seattle. Tonnages pending include 450 tons for the Sand Point hangar, general contract to the Western Construction Co., and 124 tons for the Cashmere bridge, general contract awarded yesterday to Henry Hagman, Wenatchee, Wash.

Finished Materials

Wholesalers report a good turnover of bars, shapes, sheets, plates and rivets. Business, is better than a month ago, logging operators replenishing their needs and the country districts buying in increased volume. Prices are unchanged and schedules are being well maintained, less competition from foreign materials.

Old Materials

There is no change in the steel scrap market, local mills paying $10 to $11 gross, according to quality. Supplies are ample.

Banked Stack at Gary Again Active

Chicago, Sept. 25.—With the blowing in of No. 10 furnace of the Illinois Steel Co. at its Gary works, the number of steelworks blast furnaces active in this district again has been increased to 24 out of 36. This furnace was banked four weeks ago. The ingot rate for the district thus has slightly increased to a little above 80 per cent. The leading interest now has 15 of its 27 furnaces active. Bar mill operations are close to capacity. Plate and shape mills are operating at 75 to 80 per cent. Basic iron has been piled by furnaces recently and scrap consumption has been slightly increased.

Honor W.G. Mather, Head of Cleveland-Cliffs Co.

In celebration of the fiftieth anniversary of his business association with the Cleveland-Cliffs Iron Co. and its predecessor, the Cleveland Iron Mining Co., a dinner was given to William G. Mather, president of the company, by officials and directors of the Cleveland Cliffs company in Ishpeming, Mich., Sept. 24. The company has its minng headquarters in Ishpeming, and all of the officials and managers of its Lake Superior district mining departments attended the dinner. Officials from the main offices of the company at Cleveland also were present. The dinner was served at the club house of the Ishpeming Golf club.

William G. Mather is a half brother of Samuel Mather, senior partner in the firm of Pickands, Mather & Co. His father, Samuel L. Mather, was the first president of the Cleveland Iron Mining Co. This company and the Iron Cliffs Co. were consolidated in 1890, William G. Mather continuing his connection with the Cleveland Iron Mining Co. as president.

Industrial Exposition Is Well Attended

With nearly 300,000 visitors, the Eastern State Exposition held last week at Springfield, Mass., broke all previous records. One of the chief features was the industrial art exhibit, held in a new concrete and steel building covering three acres of floor space. This year this large area was completely occupied with the booths of manufacturers and industrialists in the east, particularly in the New England states.

What is claimed as the first annual aircraft show in this country formed an important feature of the exposition. Thirty exhibitors of airplanes, engines and airplane equipment taxed the capacity of the space set aside for this show. New England industrialists are making a strong bid for a large share of the growing aircraft industry.

Canadian Iron Output Is Off; Steel Up

Toronto, Ont., Sept. 25.—Production of pig iron in Canada in August totaled 91,522 tons, compared with 95,422 tons in July and 63,234 tons in August, 1927. The August figures include 21,481 tons of malleable, 54,826 tons of basic and 15,215 tons of foundry iron.

For eight months ending Aug. 31 cumulative production of pig iron has been 654,954 tons, compared with 517,944 tons in the corresponding period of last year. August output of ferroalloys was 2537 tons, against 2855 tons in July.

August output of steel ingots and direct steel castings totaled 86,677 tons, compared with 82,807 tons in July and 77,479 tons in August, 1927. The eight-month total for ingot and castings is 819,822 tons, contrasted with 620,037 tons in the same period of 1927.

Valley Independents at 87 Per Cent

Youngstown, O., Sept. 25.—Steelworks operations average about 87 per cent this week for independents and 77 per cent for Steel corporation units. Out of 53 independent open hearths in the valley, 46 are active this week against 47 last week. Bessemer output is around 90 per cent. Strip mill operations are at capacity, and sheet mills have 113 units active out of 127, unchanged from last week. Fifteen welded and seamless units are active out of 20, one more than last week; and the seamless units now are on double turn for the first time in months. Independent tin mills are at capacity, and the Steel corporation subsidiary at 85 per cent. Independent bar mills are operating at 65 per cent, and the Carnegie Steel Co. at 75 per cent, as in past weeks.

Hardware Association To Convene Soon

Four sessions will be held at the thirty-fourth annual convention of the National Hardware Association of the United States in Atlantic City, Oct. 15-18, at the Marlborough-Blenheim hotel. The opening session will be Monday evening, Oct. 15. Addresses will be made by W. H. Donlevy, president of the association, D. A. Merriman, president of the National Hardware Manufacturers association, and Elisha Lee, vice president of the Pennsylvania railroad. Problems of distribution in the sheet steel industry will be considered at a meeting of the metal branch of the association on Tuesday, Oct. 16. G. H. Charls, president of the National Association of Flat Rolled Steel Manufacturers, Cleveland, will address this meeting.

Indiana Scrap Rate Cut

A reduction of about 20 per cent in freight rates on scrap iron in Indiana has been ordered by the Indiana public service commission, effective Dec. 1. The commission also approved a schedule of rates on scrap iron for a large number of cities and towns in the state and ruled that the rate in Indiana shall not be more than 65 per cent of the sixth class rate for freight in the state. The sixth class rate is the lowest.

Pig Iron Shipments Gain

(*Concluded from Page* 797)

the average so far this month indicates that the total for the 30 days will exceed that of August, an exceptionally heavy shipment period. Demand from the malleable shops is especially brisk, particularly the automotive and farm implement interests. The trend of prices is firm, and recent advances are meeting with little resistance. Fractionally higher quotations by southern blast furnaces are looked for, though no definite announcement has been made. The leading local producer is firm at its recent advance to a range of $19.50 to $20, f.o.b. Granite City. Sales in the past week totaled approximately 1800 tons. An inquiry calls for about 10,000 tons of foundry and malleable grades.

Philadelphia, Sept. 25.—Two thousand tons of New York state low phosphorus iron has been sold in this territory for use in gray iron foundry mixtures, at the regular price for low phosphorus iron. Otherwise current selling involves scattered lots of foundry iron, bringing $20, base, eastern Pennsylvania furnace. The Pulaski Iron Co.'s furnace went out of blast last Friday after a run of two years and seven months. All Virginia furnaces now are idle.

Birmingham, Ala., Sept. 25.—Pig iron sales are steady for delivery during the fourth quarter. The price is firm at $16.25, base, Birmingham. No plans have been made for greater production. The Gulf States Steel Co. still is producing foundry iron, and another furnace heretofore on basic is making foundry iron. The city furnace of Sloss-Sheffield Steel & Iron Co., rebuilt, will be blown in about Nov. 1.

Toronto, Ont., Sept. 15.—With upward of 60 per cent of the melters covered for fourth quarter contracting for pig iron is on the decline. Melters who have not covered are showing interest in the market and inquiries still are appearing in good numbers. About 5000 tons were closed during the week. Spot business now holds a prominent place in the market. Prices continue stronger.

Youngstown, O., Sept. 25.—A few small sales of pig iron have been made within the week by valley furnaces. Tonnages of No. 2 foundry went at $17, base, furnace, for delivery to the end of the year.

On Sept. 11, the first meeting of the 1928-29 session was held by the Hartford, Conn., chapter of the American Society for Steel Treating. H. E. Allen, chief metallurgist, Henry Disston & Sons, Philadelphia, spoke on "Tool Steels." An interesting discussion followed.

Stocking of Steel Found to be Negligible

(*Concluded from Page* 785)

house stock but state material ordered out from mills represents normal requirements. One interest selling a heavy volume of bars is stocked almost to capacity, as for many months. Warehouses report some fear of a possible disarrangement of shipping because of the recent threatened strike of trainmen on 55 western railroads, but this has not stimulated stocking.

An important manufacturer using various kinds of finished material, including special analysis steel, plans to increase stocks along some lines, particularly in special analysis materials, for which the price advance may amount to more than $2 a ton.

Another manufacturer is emphasizing reduction of steel inventories in the face of the proposed advance in finished materials. This buyer does not regard the $2 rise as of sufficient import to warrant holding material in stock. The price advance, coming late in the year, has tended to discourage accumulation of stocks against year-end inventory taking.

Cold bar finishers are carrying normal stocks of bars, and find customers, while showing interest in fourth quarter contracting, refraining from building up stocks of material beyond what may be regarded as a reasonable safeguard.

* * *

CLEVELAND, Sept. 25. — Steel stocks among representative consumers are in no case abnormal. In several instances they are subnormal compared with a year ago, chiefly because these users have more orders ahead of them than usual at this season.

Piece-meal, hand-to-mouth or fill-in buying is the accepted order of the day except insofar as the mill delivery situation forbids.

As mill deliveries become more deferred buyers are forced to anticipate, but as a general rule the mills themselves have become so facile and so flexible in handling orders that consumers are able to avoid heavy inventories and escape the expense of laying down and picking up stocks.

An official of a large warehouse interest, who has just returned from a canvass of the northern Ohio territory and who finds an absence of speculative buying, states:

"After three days of interviewing representative steel consumers, I return firmly convinced that this 'boom' in the steel business is not the result of price increases or political propaganda; it has no 'soap bubble' character but finds its basis in actual improvement among diversified manufacturing lines. Stocks nowhere are large. For that very reason when a manufacturer books an order, he immediately has to order steel. We as supply depot operators come in for a large share of this betterment, since in many instances the buyer cannot wait three to six weeks for mill deliveries but gleans a certain amount of tonnage which we can ship quickly from warehouse.

"Steel buyers are changing their price attitude. Whereas a year ago they were pointedly skeptical about the mills obtaining and holding any price advances, now I find them admitting, 'Well it looks as if they are going to get their higher figures.' As I sum it up, banks and financial interests during the past year have come out in a flat-footed way and have said to steel mill executives: 'Look here you steel men—your stocks and bonds are not worth as much as they should be; some of the people you sell to are enjoying as much as a 28 per cent return on invested capital—you're only getting about 5½ per cent. It's time you were waking up. Your securities have less value because they don't earn as much as they should.' It has become increasingly evident that the steel industry listened, took the bull by the horns and (at a time even less opportune than 1927) inaugurated a price advance. As is proverbially true, with that action they created a buying movement. Business is improving itself.

"I find in my survey improvement in those lines which only show betterment when business in general is good. Boiler makers are active. Small tool makers are working overtime. One or two special machinery makers are operating with night-shifts; others have all the work they can handle. Blast furnace repairs are being made. Rolling mill machinery is being brought into efficient condition. Every automotive parts maker who has an order is as busy as he can be to complete it in the required time. Structural fabricators find that owners are clamoring to have buildings completed before cold weather. And so on, all down the list.

"Political boom? No sir, this is a business boom. Consumption is on the increase. This alone can explain the recent influx of orders—a raise of merely $2 a ton would never do it. There is less speculative buying than in a decade. Business will continue to improve well into 1929."

A representative manufacturer of oil stoves for domestic and export trade has a slightly increased inventory of sheets but in this case and in several others interviewed this increase was found to be predicated upon a natural expansion in its business which comes from year to year, rather than from any desire to stock steel this quarter because it is going to cost more next quarter.

A maker of enameled steel parts and several other representative steel consuming lines report that while they have contracted ahead as far as permitted at the old figures, they have not stored steel beyond their normal inventory.

Canadian Output 11 Per Cent Over 1926

Toronto, Ont., Sept. 25.—Revised figures by the mining, metallurgical and chemical branch of the dominion bureau of statistics placed the value of pig iron, steel ingots and direct steel castings, and rolled iron and steel products in Canada in 1927 at $46,412,717, an increase of 11 per cent over 1926.

The iron and steel industry of Canada has a capital investment of $96,295,734, employs an average of 7396 persons who are paid $11,809,198 in salaries and wages. Raw materials cost $18,993,940 and by the manufacturing process $27,418,777 is added.

Per capita production of pig iron in Canada in 1927 was 167 pounds, contrasted with 181 pounds in 1926 and 136 pounds in 1925. Ontario produced 65 per cent of the Canadian output in 1927, against 67 per cent in 1926. The remainder is accredited to Nova Scotia. In 1927, 20 plants in Canada made steel ingots and direct steel castings while there were 11 iron and steel rolling mills in the dominion.

Scrap Institute Forming Many Chapters

New York, Sept. 25.—Iron and steel scrap dealers meet at the Hotel Astor, Sept. 27, to organize a metropolitan chapter of the Institute of Scrap Iron and Steel, 11 West Forty-second street. Benjamin Schwartz, director general of the institute, will be the principal speaker. He will outline conditions in the trade and enumerate the purposes of the recently organized institute.

A similar meeting will be held in Springfield, Mass., Sept. 26, and in Philadelphia, Oct. 2, at the Manufacturer's club. Joseph G. Hitner, president of the institute, will preside at the Philadelphia meeting. Other meetings are contemplated for Wilkes-Barre, Pa., Harrisburg, Pa., Pittsburgh, Baltimore, Washington and Buffalo.

Buffalo at 87 Per Cent

Buffalo, Sept. 25.—Operations here hold at a high rate, with 87 per cent of the open-hearth units of the district in operation. Tentative early fourth quarter operating schedules indicate continuation of this rate.

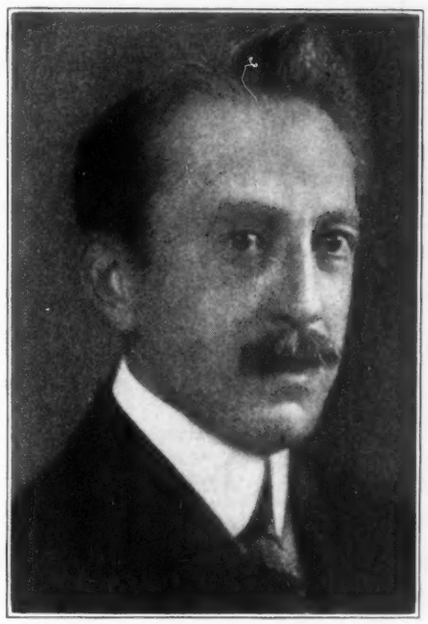
Industrial Men in the Day's News

John W. Platten, Chairman of Gulf States Steel Co.

A CANADIAN by birth, he has long been prominent in the executive affairs of many railroads in the United States, where he came after completing his education.

HIS first contact with the company, of which he is now an important official, came about through its reorganization.

HE HAS made himself familiar with the workings of the organization and consequently is prepared to attend personally to the many and various problems that arise.



JOHN WESLEY PLATTEN, chairman of the executive committee and recently elected chairman of the board of directors of the Gulf States Steel Co., Birmingham, Ala., succeeding the late James Bowron, as noted in IRON TRADE REVIEW, issue of Sept. 13, was born at Port Perry, Ont., Canada. He received his education in the public and high schools and started his business career in 1888 in the office of the assistant general passenger agent of the New York, Pennsylvania & Ohio railroad at Cleveland.

Later he became connected with the Erie railroad in the offices of the vice president and general manager, working his way steadily upward to the position of chief clerk in the operating department. Shortly thereafter, he became assistant purchasing agent. Mr. Platten was treasurer of the Erie railroad in 1901, leaving that road in 1903 to become assistant to the president of the Lehigh Valley railroad. He took the position of second vice president in 1904 and continued in that capacity until 1905 when he was elected vice president of the United States Mortgage & Trust Co., New York. He continued this association and in 1910 he was elected to the presidency, a position he now holds.

Mr. Platten also is vice president and chairman of the board of directors of the Chicago & Eastern Illinois railroad and the Gulf, Mobile & Northern railroad; treasurer and director of the Atlanta & Charlotte Air Line railroad and a director of the Hudson & Manhattan railroad and many others in New York and elsewhere. His connection with the Gulf States Steel Co. began when he was a member of the creditors' committee of the old Southern Iron & Steel Co. He later became chairman of the committee and led the reorganization of the properties into what is now the Gulf States company.

Mr. Platten has been persistent in boosting the Gulf States company and has visited Birmingham and the district wherein the properties of the company lie, acquainting himself with these properties and attaining a first hand view in order that he may meet all problems with a full knowledge of existing situations.

L. C. WILSON, formerly president of the Federal Malleable Co., Milwaukee, has been made assistant to the president of the Interstate Iron & Steel Co., Chicago. Mr. Wilson was graduated from the Sheffield Scientific school of Yale university in 1907. He became connected with the sales department of the Harbison-Walker Refractories Co., and represented that company for several years in the Pittsburgh, Chicago, New York and New Haven, Conn., districts. Later he joined the staff of the Chain Belt Co., Milwaukee, as assistant to the vice president and later as general sales manager. Transferring to the Federal Malleable Co. as secretary, he later was elected vice president and general manager and then was made president. Mr. Wilson has been active in the work of the American Foundrymen's association. At the Detroit convention in 1926 he was elected a director of the association for the 3-year term.

* * *

E. F. Scott, formerly with the Austin Co., Cleveland, was made secre-

tary-manager of the Ohio State Foundrymen's association, succeeding Arthur J. Tuscany, who has resigned, as noted in a previous issue. For the past six years Mr. Scott has been with the Austin Co. as engineering specialist in layout, design and equipment of foundries. His duties also took him into sales promotion and representative work. For several years Mr. Scott has devoted considerable time to the study of the problems of the foundry industry, including foundry layout and the design of equipment. Mr. Scott will take over the work of the Ohio State group Oct. 1.

* * *

William B. Wingert, formerly with the Semet-Solvay Co., Detroit, has become associated with the Ironton By-Products Coke Co., Ironton, O.

* * *

J. A. Dombart has been placed in charge of the Norwalk Drilling Tool Co., Norwalk, O., succeeding the late James Kavanaugh.

* * *

J. M. Fuller, president of the Harrington & King Perforating Co., Chicago, has just returned after a three-month trip in Europe.

* * *

B. E. Kibbee, vice president in charge of sales of the Sharon Steel Hoop Co., has been elected a director of the company, filling an existing vacancy.

* * *

Robert T. Wilson, Pittsburgh, has been elected a director of the Newton Steel Co., Youngstown, O., to fill the unexpired term of Harold A. Taylor, who recently resigned upon his removal to New York.

* * *

D. Walker Wear has been made president of the Stow Mfg. Co. Inc., Birmingham, N. Y., succeeding Clarence F. Hotchkiss, whose death was announced in IRON TRADE REVIEW last week.

* * *

George S. Jones, formerly assistant manager of the bar and specialty division of the Republic Iron & Steel Co., Youngstown, O., has been appointed district sales manager with headquarters in the general office.

* * *

Frank B. Parker, general manager of Briggs & Turivas Inc., dealer in scrap iron and steel products, with general offices at Blue Island, Ill., Chicago suburb, has been made vice president and general manager of the company.

* * *

George A. Cooper, of the Monongahela West Penn Public Service Co., Fairmont, W. Va., has been made an assistant chief business specialist in the division of simplified practice of the bureau of standards, United States department of commerce, Washington.

* * *

John C. White, president of the Arrowhead Iron Works of Pennsylvania Inc., has become associated with the Blaw-Knox Co., Pittsburgh, and has been made sales manager of the steel grating and flooring department, with headquarters at the general offices.

* * *

J. E. Sullivan, formerly superintendent of blast furnaces and ore docks of the Sparrows Point, Md., plant of the Bethlehem Steel Co., has been made vice president of Edgar E. Brosius Inc., Pittsburgh, designer and manufacturer of grab buckets, steel mill equipment, etc.

* * *

J. G. Parker has been appointed district engineer and sales representative for western New York for the Despatch Oven Co., Minneapolis.

Joseph J. Beeman has been appointed to a similar position in the Michigan territory for the Despatch company.

* * *

E. J. Phillips has been placed in charge of the San Francisco territory of the Van Dorn Electric Tool Co., Cleveland. He is succeeded in Detroit by his brother, George Phillips.

J. F. Spaulding has been transferred to the Baltimore territory for the Van Dorn company, succeeding Jack Beggs, who has been brought to the Cleveland headquarters from Baltimore.

* * *

Clyde H. TenEyck, for a number of years connectetd with the operating department of the Illinois Steel Co., Chicago, has resigned to become associated with Bliss & Laughlin Inc., Harvey, Ill., manufacturer of cold rolled steel and shafting, in an executive capacity. Mr. TenEyck has been identified with the steel industry for 20 years.

* * *

S. M. McManus has been elected president of the Muskogee Iron Works, Muskogee, Okla., succeeding C. L. N. Haines, whose death was announced in IRON TRADE REVIEW, issue of Aug. 30. Mr. McManus continues with his duties of general manager of the plant.

H. H. Elliott has been elected vice president of the Muskogee company.

* * *

Fred H. Doolittle, formerly secretary-manager of the Apartment House Owners association, Cleveland, has been appointed middle states representative for the Gray Iron institute, Cleveland. Previous to organizing the apartment house owners, Mr. Doolittle was for three years membership secretary of the American Plan association, Cleveland.

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Alonzo F. Allen, secretary and assistant treasurer of the American Steel & Wire Co., Cleveland, has been made treasurer in addition to his secretarial duties, succeeding J. R. Thomas. Mr. Thomas, since May, 1915, treasurer of the company, has been retired on a pension after serving the company for 43 years.

R. R. Hampson, for many years assistant treasurer of the company at New York, has resigned.

R. S. White has been made assistant secretary and assistant treasurer at New York. C. S. Cawthorne is assistant secretary and assistant treasurer at Chicago, and J. G. Nelson has been made assistant secretary and assistant treasurer at Cleveland.

Auto Production Sets New High Mark

Washington, Sept. 25.—All previous records fell before the August automobile production total reported by the department of commerce. In the United States in August output was 458,429 passenger cars and trucks, exceeding the previous record month of April, 1926, in which the output reached 441,306 cars. Following are comparisons:

	—United States—			†Canada
	Total	Passenger cars	Trucks	Total
1926	4,298,802	3,808,753	490,049	204,556
Total 1927				
Aug.	308,826	274,381	34,445	12,526
Tot. (8 mos.)	2,646,285	2,313,869	332,416	150,321
Sept.	260,387	226,443	33,944	11,262
Oct.	219,719	183,042	36,677	*7,748
Nov.	134,416	109,758	24,658	6,617
Dec.	133,579	106,080	27,499	*3,106
Total (year)	3,394,386	2,939,192	455,194	*179,054
1928				
Jan.	231,693	205,576	26,117	8,463
Feb.	323,809	291,151	32,658	12,504
March	413,386	371,821	41,565	17,469
April	410,191	364,877	45,314	24,211
May	*425,863	375,863	*50,000	33,942
June	*396,669	356,439	*40,230	28,399
July	*391 180	*338,0^8	*53,082	25,226
Aug.	458,429	400,689	57,740	(1)
Total (8 mos.)	3,051,220	2,704,514	346,706	.....

†Reported by Dominion bureau of statistics.
(1) Not available.
*Revised.

Abrasive Output High

Westfield, Mass., Sept. 25.—Manufacture of abrasive materials in this district is at a high point. Both American Abrasive Co. and Vitrified Wheel Co., of this city, report business ahead of last year. Federal Abrasive Works Inc. is on full time schedule and the plants at Chester, Mass., near here, report prosperous conditions.

British Steel Demand Increases

Substantial Orders Placed for Railroad Equipment and Structural Material—Spiegeleisen and Ferromanganese Shipments Improve—Continental Markets Stronger—Rail Manufacturers Increase Price

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Sept. 25.—(*By Radio*)—Conditions in the British steel market continue to improve. Substantial orders for railroad equipment were placed during the past week, including 400 steel cars for South Africa and 20 cars for New South Wales, with other orders from India, Egypt and Peru. Steelworks in the Birmingham district are obtaining many domestic contracts for building construction. Steel mills in Scotland also are well engaged, and from all indications mill schedules will be maintained well into October. The markets for galvanized sheets and tin plate are firm.

Demand for Middlesbrough pig iron is improving. Fifteen hundred tons of spiegeleisen was shipped to Canada recently. Demand for ferromanganese is increasing. Some tonnages of special grades of Barrow low phosphorus iron are being forwarded to United States, France, Belgium and Germany.

A report from Brussels states iron and steel prices show a stronger tendency, except high-grade sheets for which British makers are competing. German exports are increasing, and prices now are profitable. Good deliveries are offered. American competition is reported in the Far East. French market prices are firm, and the outlook for business is considered good. Prices have been increased 60 cents a ton by the European Rail Manufacturers' association.

Wales and America Divide Tin Plate Market

BIRMINGHAM, Eng., Sept. 14.—An agreement has been reached between American and Welsh tin plate manufacturers allocating the world's tin plate markets, the immediate effect of which will be that Wales stands to gain to 2½ per cent in the previous proportion. The object of the agreement is to secure if possible the freedom of the United States from Welsh competition in certain export markets in which America holds much capital investment in the local packing industry.

Sterling $4.85

In return for this concession American tin plate makers are to refrain from competing in other markets that have long been regarded as essentially belonging to South Wales Under this agreement the European export market is secured to South Wales while the United States will be conceded priority of position in the South American and Canadian markets. Japanese business will be shared in accordance with the present ratio of distribution. At Swansea it is stated that South Wales will have about 70 per cent of the world's export trade and the United States 30 per cent. Under the Agreement absolute freedom in regard to prices will be assured. It is contended that Americans by means of a new process of substituting strip steel for ordinary tin plate bars gave the tin plate manufacturer material at a reduced cost and enabled working costs to be cut considerably. This forced the hand of the Welsh tin plate

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, September 24	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$16.01	3 6 0*	$15.28	3 3 0	$15.28	3 3 0	$15.76	3 5 0
Basic	15.76	3 5 0	15.28	3 3 0	15.28	3 3 0	15.28	3 3 0
Basic-bessemer	16.73	3 9 0†	14.79	3 1 0	14.79	3 1 0	14.55	3 0 0
Hematite, Phosphorus 0.02-0.05	16.61	3 9 0	22.09	565*	.....	.....	.....	3 10 0
SEMIFINISHED STEEL								
Billets	$29.10	6 0 0	$23.77	4 18 0	$23.77	4 18 0	$23.77	4 18 0
Wire rods	41.23	8 10 0	29.71	6 2 6	29.71	6 2 6	29.71	6 2 6
FINISHED STEEL								
Standard rails	$37.59	7 15 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.55c	7 2 6	1.38c	6 5 0	1.38c	6 5 0	1.38c	6 5 0
Structural shapes	1.60c	7 7 6	1.12c	5 2 0	1.12c	5 2 0	1.10c	5 0 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.40c	6 7 6	1.40c	6 7 6	1.42c	6 9 0
Sheets, black, 24 gage	2.17c	10 0 0	2.34c	10 12 6	2.34c	10 12 6	2.19c	9 19 0
Sheets, galvanized, 24 gage, corrugated	2.80c	13 7 6	3.01c	13 13 9	3.01c	13 13 9	2.93c	13 6 0
Bands and strips	2.22c	10 5 0	1.56c	7 2 3	1.56c	7 2 3	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.60c	7 5 0	1.60c	7 5 0	1.60c	7 5 0
Galvanized wire, base	2.93c	13 10 0	1.98c	9 0 0	1.98c	9 0 0	2.01c	9 3 0
Wire nails, base	2.38c	11 0 0	1.65c	7 10 0	1.65c	7 10 0	1.65c	7 10 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	.....	$ 6.80	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.01	3 6 0	$17.20	440(2)	$16.40	590	$18.60	78
Basic pig iron	15.76	3 5 0	18.57	475(1)	15.01	540	20.98	88
Furnace coke	3.15	0 13 0	5.87	150	5.14	185	5.13	21.50
Billets	29.10	6 0 0	21.70	555	25.72	925	28.85	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1.250	1.51c	140
Merchant bars	1.57c	7 5 0	1.28c	710	1.43c	1.100	1.52c	141
Shapes	1.71c	7 17 6	1.17c	650	1.19c	915	1.49c	138
Plates, ship bridge and tank	1.87c	8 12 6	1.54c	855	1.50c	1.155	1.71c	158
Sheets, black, 24 gage	2.28c	10 10 0	2.92c	1.620	2.44c	1.880	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.93c	13 10 0	3.41c	1.895	3.87c	2.975	3.78c	350
Plain wire	2.12c	9 15 0	1.71c	950	2.02c	1.550	2.48c	230
Bands and Strips	2.22c	10 5 0	1.42c	790	1.79c	1.375	1.77c	164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £21 14s 0d ($105.25) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

manufacturers who have been obliged to take concerted action to produce strip steel by continuous process and enable them to compete on level terms with the Americans. The success achieved at some new mills in the South Wales district has led to the claim that higher results have been obtained there than in the United States.

A moderate amount of business is being transacted at 18s ($4.37) to 18s 3d ($4.43) with a fair volume of inquiries in the market. Some makers quote higher figures especially for forward shipment.

Statistics of production show decreases in pig iron and steel ingots in August, but since this month included the holiday period the figures need not be viewed with alarm. Since September opened trade has shown a healthy expansion in all districts and home consumption and export are increasing. Only one furnace went out of blast in August, leaving a total of 130. Pig iron production totaled 519,000 tons, against 537,800 in July. Ingot production was 648,300 tons, compared with 666,900 the previous month. For the first time for many weeks Birmingham merchants are able to report better demand for pig iron. It is not spectacular and foundries are proceeding on cautious lines. They avoid contracting and buy lots of 10 or 20 tons. Prices hold firmly at £3 ($14.55) for Derbyshire, £2 15s 6d ($13.45) for Northampton and £3 2s 6d ($15.15) for the rather special brand of North Staffordshire. East coast hematite is selling at £3 9s ($16.72) to £3 10s ($16.97) some of this finding its way to Midland works. Midland makers also use a special brand of Welsh hematite at £3 10s ($16.97).

The outlook on the west coast is improving and makers' order books are looking better than for some time. Prospective buying of superior grades of iron by Continent users is talked of and some American shipments have beeen made. Middlesbough No. 3 is firm at £3 6s ($16.00) with a larger volume of business and some forward buying. At present output is sufficient for the demand.

In steel, improvement affects most descriptions of steel, with the exception of plates. Producers are still grumbling about lack of orders, which they attribute to idleness in the shipyards. But many berths are being filled and a little later plate mills should benefit. In small bars, however, some mills are busy, mainly because the Continent price is prohibitive and deliveries are slow.

Though the upward movement in Continental steel has brought prices practically to the level of English works Belgian No. 3 iron can still be bought at £7 2s 6d ($34.55) delivered in the Black country. Nut and bolt makers in the Darlaston district say they are bound to use this iron as they cannot afford to buy Staffordshire material at £9 ($43.65). In addition they contend that Belgium is swamping Britain with finished bolts at about £2 ($9.70) per ton cheaper than the English maker can afford to sell. Another example of this is in the tube trade. The Staffordshire makers of tubes are doing fairly well but would have a good deal more work if it were not for the fact that Germany is sending in quantities of finished tubes into the Walsall district, and this in spite of the fact that German tube strip costs 2s 6d ($0.60) more than English steel welded quality selling at £7 5s ($35.16) per ton.

French Coke at New Top

Paris, Sept. 10.—(*European Staff Service*)—In July French collieries once more exceeded their previous record coke production with 370,259 metric tons, against 369,360 tons, the previous high mark, in March. July coke imports included 322,462 tons from Germany, 59,725 tons from Belgium, and 45,104 tons from Holland. July coke exports went to Italy, 22,722 tons; Switzerland, 12,052 tons; Yugoslavia, Belgium and Luxemburg, Spain, Germany, Sweden and other countries. The following table gives comparisons in metric tons:

Mon. ave.	Production	Imports	Exports
1913	335,620	255,835	17,085
1925	255,410	416,880	39,440
1926	313,950	462,915	39,320
1927	339,015	395,580	33,480
1928			
Jan.	357,475	473,018	25,840
Feb.	343,186	411,455	23,119
Mar.	369,360	445,656	15,324
Apr.	360,446	482,575	22,689
May	367,725	526,593	12,366
June	360,141	489,144	30,507
July	370,259	427,291	42,342

German Trade Steady

Berlin, Sept. 10.—(*European Staff Service*)—Exports of steel products from Germany in July were at the highest figure of the year. Among principal items exported in July were 111,610 tons of bars, shapes, hoops and bands; 50,728 tons of rails, sleepers and track fastenings; 49,683 tons of semifinished products; 37,770 tons of plates and sheets, black; 35,870 tons of forged tubes; 34,570 tons of wire rod and wire; 13,026 tons of forgings.

Among the principal items imported in July were: 63,974 tons of bars, shapes, hoops and bands; 26,936 tons of semifinished steel, the tonnage of all other items imported being less than 10,000 tons. Scrap exported from Germany in July was 27,745 metric tons, while 17,974 tons were imported. The following table gives comparisons in metric tons:

	IMPORTS		EXPORTS	
Mon. ave.	Pig iron	Other iron and steel	Pig iron	Other iron and steel
1925	17,190	103,525	18,540	277,190
1926	9,230	95,890	42,730	402,905
1927	23,895	217,505	29,910	347,645
1928				
Jan.	27,493	234,899	13,879	349,147
Feb.	23,086	217,238	21,579	369,197
March	19,068	229,267	26,488	408,310
April	27,113	219,298	19,583	393,227
May	26,742	159,708	18,445	380,025
June	31,422	145,783	20,628	432,603
July	29,765	153,005	23,557	442,528

German Sales Unions Review August Results

BERLIN, Sept. 10.—(*European Staff Service*)—The German raw steel association recently discussed the questions of division between various members of penalties for production in excess of the quota allowed by the European steel entente. A number of representatives were of the opinion that only those concerns which had exceeded their individual quota should contribute to the fund, but it was finally decided that the fines should be equally divided between the members at the rate of 3.50 marks (83c) per ton in excess.

The Stahlwerksverband has issued its report covering activities of the various unions during August. The A-products union, which handles semifinished steel, structural steel, and rails, reports that domestic sales of semifinished steel showed no improvement over the preceding month, whereas export trade improved, both in orders and prices. In structural steel an improvement was registered in the domestic market, but export trade was quiet. Demand for rails and track material from German railroads has improved, but not yet sufficiently to occupy the mills.

The merchant bar union reports that domestic transactions during August were up to normal, export business was satisfactory, and prices advanced. The hoop and band union reports good business, both at home and abroad, while the plate union reports that business during August was slow. Some orders for ship plates have been received from foreign yards. No change has been reported by the tube union. There is movement in Germany toward formation of an international syndicate for handling basic bessemer slag. Sales of slag in the German market are unprofitable, and it is hoped the countries which have joined the steel entente will come to an agreement with regard to the slag market.

It is reported that the Mannesmann concern has decided to propose an increase and a transformation of its capital. It is proposed that 20,000,000 marks of preferred shares now existing should be transformed into ordinary shares, and that an additional 5,000,000 marks of ordinary shares should be offered. This would bring the ordinary share capital to 25,000,000 marks (about $6,000,000). New preferred shares to the amount of 20,000,000 marks ($4,750,000) then would be offered in turn. Reporting on the activities of the concern during the first half of this year, it is stated that sales of tubes were about of the same volume as during the first half of 1927, but sales of coal were effected at lower prices. However, the return on the investments of the company and the decrease in the financial charges are such that the financial result for the first half of this year should be about on the same level as a year ago.

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

CRANE CO., Chicago, which recently acquired the Landon Radiator Co., North Tonawanda, N. Y., will manufacture radiators on a large scale. From 1865 to 1895 it made pipe radiators and in 1889 began to manufacture cast iron sectional radiators, but owing to the expansion of other lines, which absorbed the company's manufacturing facilities, production of cast iron radiation was abandoned.

As the Tonawanda plant has not sufficient capacity to supply the needs of Crane Co., and has no boiler department, it is the intention of Crane Co. to manufacture both radiators and boilers at Bridgeport, Conn., Chicago, and possibly Chattanooga, Tenn. The Landon plant is modern in all respects, having been in operation only since last February. It was developed under the personal supervision of A. A. Landon, formerly vice president in charge of manufacturing of the American Radiator Co. Mr. Landon will become identified with the new interests.

* * *

ROSS HEATER & MFG. CO., INC., has opened an office at 121 North Broad street, Philadelphia, in charge of J. W. Spencer Jr., who has been in the company's office at New York for several years.

* * *

AMERICAN STEEL CO., East St. Louis, Ill., has a $250,000 program of plant improvement and construction. The new structures will be adapted to a general line of castings. Heretofore the company has specialized in railroad castings.

* * *

FREDERICK MACHINE WORKS, Norwalk, O., has completed an addition to its plant and has started production of a garden tractor and tools and equipment for its use. A further addition will be built next spring.

* * *

BARBOUR-STOCKWELL CO., Cambridge, Mass., is now under full production in its new brass foundry. The foundry is housed in a modern, well lighted brick building, 40 x 60 feet, with overhead traveling crane. One end of the building has the cleaning department, a stockroom and washroom. The other end has the molding and pouring floors with six furnace pits, with a capacity of about three tons of brass a day. The molding floor has a jolt squeezer molding machine and other machines will be installed. The foundry is in charge of Edward Lyons.

* * *

HANSON CLUTCH & MACHINERY CO., Tiffin, O., is completing two additional buildings, each 52 x 200 feet. They will be used for assembly of excavating machinery. Two further additions will be built next spring for production of machine parts.

* * *

HAZARD WIRE ROPE CO., 32 South Clinton street, Chicago, will move its offices and warehouse to 654 West Lake street, that city, where the first floor and basement and a rear space extending for a half block or more have been leased for a period of years.

* * *

LINCOLN ELECTRIC CO., Cleveland, entertained its salesmen from the United States and Canada recently in the Lincoln research laboratories at demonstrations of its new devices. Tests were made of performance and ease of operation of its welders. Application of the company's principles to arc welding were also demonstrated and the wide range of application was indicated.

* * *

HARDIE-TYNES MFG. CO., Birmingham, Ala., is shipping to Rundvick, Sweden, a machine used in the manufacture of pressed wood and structural insulating boards. The product is made from slabs and edgings of saw mills and lumber mills, heretofore a waste product. One plant is in operation at Laurel, Miss., and the second is being built in Sweden. The machine was designed and built by Hardie-Tynes engineers. It weighs 75,000 pounds. It will take four weeks to arrive at Gothenburg, from which point it will be taken on lighters to Rundvick.

* * *

NIAGARA MACHINE & TOOL WORKS, Buffalo, has opened a sales office at 50 Church street, New York, in charge of H. D. Rosenkrans as district manager. The company has been engaged for 50 years in manufacturing tools for the sheet metal trade. Sales offices are maintained at Philadelphia and Pittsburgh. Mr. Rosenkrans has been with the company for nine years. The New York office will serve Fairfield county, Conn., Westchester and Rockland counties, New York, Manhattan, Long Island, Staten Island and New Jersey north of Trenton.

* * *

MANUFACTURERS FOUNDRY CO., Holland, Mich., has been incorporated for $75,000, and will operate the plant of the Western Foundry Co. of that city which has been acquired by the following manufacturers: Western Machine Tool Works, Holland; Morton Manufacturing Co., Muskegon Heights; Sanitary Sewer Basin Co., Chicago; and the Western Foundry Co., Chicago. The officers of the new company are Henry Morton, president and general manager, Muskegon Heights; Henry Winter, vice president; John Arendshorst, secretary; G. J. Bosch, treasurer; Paul Vander List, superintendent; all of Holland, and Nicodemus Bosch and Howard J. O'Neil of Chicago, who form the board of directors. The organization of the new foundry was promoted by Carl E. Swift, C. E. Swift & Co., agents for sheet metal, tin plate, pig iron, etc.

Work On Buffalo Plant

Buffalo, Sept. 25.—Foundations for the new local plant of Bliss & Laughlin Inc., Harvey, Ill., cold bar and shafting finishers, are nearly completed and structural steel will be erected the middle of October. Completion of the plant is scheduled for Feb. 15. The plant will embrace 90,000 square feet of floor space and employ about 150 men.

Duties on agricultural and horticultural machinery imported into France are assessed on legal weight, by recent decree, Commercial Attache H. C. MacLean, Paris, cables the department of commerce.

Obituaries

PAUL ARMSTRONG, president and one of the founders of the Armstrong Bros. Tool Co. and Armstrong-Blum Mfg. Co., Chicago, died in River Forest, Ill., Sept. 20. Born Jan. 13, 1863, in Perth, Scotland, Mr. Armstrong came to the United States when he was three years old. The Armstrong Bros. Tool Co. was founded in 1893 in Chicago. He was connected with a number of organizations in and around Chicago.

* * *

Henry S. Lyons, vice president of the Massachusetts Gas Co. and president of the Mystic Steamship Co., died in New York, Sept. 22.

* * *

Henry C. Bandau, one of the founders and president of the Kohver Pattern Co., Milwaukee, died Sept. 16. He was born in Fort Wayne, Ind., in 1877 and lived in Milwaukee 25 years.

* * *

Percy C. Dierdorff, manager of the Cleveland office of the Jeffrey Mfg. Co., Columbus, O., died at his home in Lakewood, O., Sept. 17. Prior to becoming manager of the Cleveland office in 1913, Mr. Dierdorff was with the home plant of the Jeffrey company for 10 years.

* * *

Joseph R. Dilworth, 67, chairman of the board of Dilworth, Porter & Co., Pittsburgh, manufacturer of spikes and tie plates, died Sept. 20 at his home in Southampton, Long Island, N. Y. He had been a semi-invalid for several years. Mr. Dilworth was born in Pittsburgh and was graduated from Yale university. In 1905 he left Pittsburgh and established his home in Long Island.

* * *

Walter C. Arthurs, president of the Mt. Vernon Car Mfg. Co., Mt. Vernon, Ill., whose death was noted in IRON TRADE REVIEW last week, started in the car industry in 1887 when he became associated with the Litchfield Car & Machine Co. as cashier and paymaster. About three years later he was made secretary and treasurer of the Mt. Vernon company. When the company went into receivership in 1897, Mr. Arthurs was appointed receiver and by 1902 had succeeded in bringing it out of bankruptcy. Mr. Arthurs was then elected vice president and treasurer and in 1908, upon the death of D. O. Settlemire, he became president of the company, which position he held until his recent death.

Castings Output Rises

Washington, Sept. 25.—A comfortable gain in commercial steel castings bookings was noted in August, according to the department of commerce. Production also increased in August. Monthly comparisons follow:

	BOOKINGS		PRODUCTION	
Total	†Total net tons	Railway specialties	†Total net tons	Railway specialties
1926	1,035,778	404,945	1,135,955	427,016
1927				
Aug.	63,528	21,144	87,004	32,397
Total, 8 mos.	674,963	28,331	714,953	284,585
Sept.	52,351	18,396	70,024	25,618
Oct.	51,748	16,625	62,409	21,947
Nov.	62,683	27,639	58,997	19,146
Dec.	76,953	39,112	58,220	19,358
Total	918,698	384,103	964,603	370,654
1928				
Jan.	91,072	41,276	74,082	28,714
Feb.	90,677	41,096	87,323	37,719
March	83,285	30,992	93,521	38,448
April	83,737	32,810	85,669	32,619
May	86,414	34,995	92,948	36,599
June	71,745	22,597	91,387	30,742
July	*66,667	20,483	*78,324	27,571
Aug.	80,932	25,171	86,809	27,157
Total 8 mos.	654,529	249,420	690,063	259,499

†For tonnage of miscellaneous castings deduct Railway Specialties from this total.
*Revised.

Babbitt Metal Advances

Washington, Sept. 25.—Total apparent consumption of babbitt metal in August gained satisfyingly over July, according to the department of commerce. Following are comparisons by months:

	Total apparent consumption	Sold by manufacturers	Consumption by producers
	(Figures given in pounds)		
1927			
August	5,496,659	4,488,895	1,007,764
Tot. (8 mos.)	41,232,137	32,537,497	8,694,640
September	4,792,367	4,116,525	675,842
October	5,115,598	3,860,239	1,255,359
November	4,505,954	3,320,205	1,185,749
December	4,465,787	3,169,493	1,296,294
Total, 1927	60,111,843	47,003,959	13,107,884
1928			
January	4,928,517	4,034,352	894,165
February	4,470,368	3,443,694	1,026,674
March	4,927,634	3,903,071	1,024,563
April	4,842,656	3,724,691	1,117,965
May	4,606,899	3,578,422	1,028,477
June	4,731,023	3,625,347	1,105,676
July	4,692,825	3,792,887	899,938
August	4,755,662	3,843,680	911,982
Tot. (8 mos.)	37,955,584	29,946,144	8,009,440

Foundry Orders Gain

Cleveland, Sept. 25.—August orders for foundry equipment gained heavily over the low total of July according to the Foundry Equipment Manufacturers' association. Following are monthly comparisons:

	1925	1926	1927	1928
Jan.	104.2	168.2	180.4	132.7
Feb.	108.8	154.9	198.0	123.6
Mar.	159.3	157.3	131.1	138.6
Apr.	124.3	113.2	130.0	107.7
May	113.3	128.5	134.8	335.6
June	110.5	133.5	138.4	149.1
July	117.0	127.3	89.9	94.8
Aug.	190.0	141.2	106.4	278.0
Sept.	94.2	114.0	80.4	.....
Oct.	149.5	140.5	98.0	.....
Nov.	180.3	133.4	95.8	.....
Dec.	140.1	181.0	106.8	.....

Base: Average monthly shipments for 1922-23-24.

Structural Steel Orders At Best Total

Washington, Sept. 25.—Computed tonnage of new orders for fabricated structural steel shapes in August set a new record at 356,250 tons. The previous record was 347,050 tons, made in September, 1925. Monthly comparisons by the department of commerce follow:

	Actual tonnage	Per cent of capacity	Computed tonnage	Shipments computed
Aug.	223,620	73	273,750	285,000
Total 8 mos.	.....	67	2,013,750	1,886,250
Sept.	217,109	71	262,250	270,000
Oct.	236,710	77	288,750	251,250
Nov.	193,850	63	236,250	247,500
Dec.	215,724	70	262,500	240,000
Total	.....	68	3,063,500	2,895,000
1928				
Jan.	*172,284	56	210,000	210,000
Feb.	*216,284	71	266,250	236,250
March	*210,745	69	258,750	288,750
April	*193,011	63	236,250	240,000
May	*251,843	84	315,000	266,250
June	*244,012	81	303,750	*262,500
‡July	*238,350	*79	*296,250	*270,000
†Aug.	274,467	95	356,250	300,000
Total, 8 mos.	.....	75	2,238,750	2,017,500

*Revised
‡Reported by 201 firms with a capacity of 290,155 tons.
†Reported by 191 firms with a capacity of 288,610 tons.

Steel Furniture Up

Washington, Sept. 25.—August orders for steel furniture recovered and made a slight gain over July, figures supplied by department of commerce show. Monthly comparisons follow:

	Business Group		Shelving	
	Orders received	Shipments	Orders received	Shipments
1926 Total	31,393,171	31,429,140	7,340,351	7,837,017
1927				
Aug.	2,381,889	2,474,854	592,353	604,107
Total, 8 mos.	20,655,390	20,910,847	4,997,919	4,945,161
Sept.	2,367,857	2,218,602	607,905	531,154
Oct.	2,410,552	2,379,557	551,259	619,293
Nov.	2,476,230	2,856,181	571,763	590,764
Dec.	2,850,314	2,740,602	619,276	577,910
Total	30,760,343	31,105,789	7,351,122	7,264,282
1928				
Jan.	3,248,165	2,712,663	768,748	680,264
Feb.	3,295,861	2,908,527	741,310	681,999
March	3,283,329	3,169,351	841,098	831,607
April	2,915,344	3,065,637	740,658	716,104
May	3,085,638	3,213,291	792,921	768,988
June	2,764,085	3,009,279	727,060	729,253
July	2,594,216	2,515,482	713,330	722,516
Aug.	2,619,230	2,564,633	863,429	836,104
Total, 8 mos.	23,805,868	23,158,823	6,138,545	5,957,835

Machinery

Machine Tool Activity in Practically All Markets Is Satisfactory but Manufacturers of Cranes Are Facing a Lagging Situation

SEPTEMBER sales of machine tools at New York promise to top those of August provided the September rate to date is maintained the rest of the month. At Pittsburgh the fourth quarter list of the Westinghouse Electric & Mfg. Co. is due shortly. Some dealers at Chicago note a slight decline in inquiries but no appreciable slackening in actual sales. Railroad buying is expected at St. Louis. Automotive demand continues the chief support of the machinery market at Cleveland. The slowness with which crane inquiry appears and the delay in translating inquiries into orders is distressing to the crane industry. One result has been close prices, costly demonstrations and long credit terms. Some railroad buying is being done as autumn advances.

New York, Sept. 25.—Demand for machine tools is brisk. While few sizable lists are involved, buying is substantial, with a noticeable pick-up in the past week or 10 days. If continued, it should place the month well ahead of August for most dealers. Railroad demand, however, continues noticeably small.

Crane sellers experienced another exceedingly dull week. Prolonged dullness in the crane market here is being commented upon generally. Overhead crane inquiry has accumulated in fair volume, but continued delay in placing business has proved highly discouraging.

Situation in locomotive cranes appears even less active. For crawler cranes there is a fairly good demand, but so numerous are the sellers that business is spread thinly. This has resulted not only in prices being quoted which admittedly are unprofitable in many cases, but also in granting excessively long term payments, practical demonstration of equipment on a job over a series of weeks without cost or obligation to the prospective purchaser ,and other practices believed doubtful by some.

Recent orders booked by the Pratt & Whitney Co. include seven 1 by 18-inch automatic lathes, three for one purchaser and four for another; two 6-inch vertical shapers; one deep-hole drilling machine; one 16 by 60-inch lathe; one 12-inch vertical shaper; one 8-inch rotary surface grinder and one 5-inch production hand miller. The Niles-Bement-Pond Co. has sold one 48 by 48 by 16-foot planer; 6-foot right line radial drill; three 36 to 44-inch side head boring mills; two heavy duty axle lathes; Cincinnati tapper and one Bement 2500-pound steam hammer.

Worcester, Mass., Sept. 25.—Machine tool markets show a steady but slight gain. Closing on a fairly large list of inquiries submitted earlier in the month has been slow to develop. Sales of single tools continue to mount and the demand for single motor and automatic equipment is brisk. There is an absence of large lists and railroad buying has been practically nil in New England. Lumbering and paper interests placed a number of single tools this week. Demand for replacements and new units from the automobile industry is steady. Grinding machinery is moving well.

Pittsburgh, Sept. 25.—Expansion is noted in inquiries for machine tools, and one interest reports a good volume of business closed recently. The latter consists of a number of tools pending for a number of weeks. All awards recently have been for only a few machines, large lists being lacking. Pending business is scattered among a number of users, but the aggregate is fairly large. Westinghouse Electric & Mfg. Co. is expected to issue its fourth quarter list of requirements soon.

Cleveland, Sept. 25.—While the volume of business is not quite as heavy as it was a month ago, it is considered satisfactory by both manufacturers and dealers. Except for purchases by the automobile industry, orders call for not more than one or two tools at a time. Automobile plants are operating at good schedules and are taking equipment freely. As production for fall models gets under way, buying from this quarter is expected to improve. Inquiries from all sources are not large in nature, and many of the sales are of a spot nature. Used equipment enjoys steady demand and there is little quibbling over prices.

Chicago, Sept. 25.—Sales of machine tools in the Chicago district continue at the high volume of August. Several dealers report a slight falling off in inquiries the past several days, but no marked general slump has appeared in prospective business. Billings are heavy this month, and it is indicated September may show heavier shipments than the preceding month as considerable equipment was carried over from August for shipment. Chicago, Burlington & Quincy has bought a number of machine tools on its list, and Rock Island railroad has made some additional purchases. That road, in addition to its list of a week ago, is asking bids on a beam punch, gate shear, bevel rotary shear and an 18-inch lathe. Several roads that buy at St. Louis are expected to have lists out soon. Nash Motors Co. is building an addition to its plant at Racine, Wis., and will be in the market for tools for delivery there as well as to its Milwaukee body plant. Scattered industrial orders are numerous in the Chicago district, including the Clearing Ill., industrial district, where considerable industrial expansion is proceeding. Prices are steady. Inquiry for used tools continues as active as at any time this year.

CRANE ORDERS PLACED

Crawler crane for Arthur A. Johnson Corp., New York City, to Koernig Crane company.

CRANE ORDERS PENDING

2 or 3-ton used overhead cranes, 20-foot, 4-inch span, for Rome Strip Steel Co. Inc., Rome, N. Y., bids asked; this equipment may be either handpower or motor driven and is for operation on a single I-beam track; used clamshell bucket handling crane, 30-foot span, for Ayers Mineral Co., Zanesville, O.

Neville Island Contracts To Be Let Soon

Pittsburgh, Sept. 25.—Davison Coke & Iron Co. will soon contract for construction of a by-product coke plant and a cement plant at its Neville Island property, which includes a blast furnace, purchased this spring from American Steel & Wire Co. by Sharpsville Furnace Co. The latter company is a unit of the Davison organization and will continue to operate the blast furnace at Sharpsville, Pa.

The Neville Island stack will not be lighted for some time and it is expected to take about a year to complete the by-product plant. The furnace was built in 1900 and first lighted in July, 1901. It is 21½ x 100 feet, has four Kennedy stoves and an annual pig iron production capacity of about 160,000 tons. Little repair work is required. The by-product plant will provide the coke for the blast furnace, while the by-products will be sold. This venture by the Davison company will make it the only merchant blast furnace operator in the Pittsburgh district, the old Clinton stack having been razed.

The cement plant will be operated by a system which grinds cement by a water process. After construction of various units the company will have approximately 120 acres, which may be held for development of other industrial enterprises.

Officers of the Davison Coke & Iron Co. are: President, George S. Davison; vice president and treasurer, Allen S. Davison; vice president and secretary, Albert P. Meyer.

Officials of the A. L. Stone Road Machinery Co. of Connersville, Ind., have filed papers with the secretary of state in Indianapolis evidencing preliminary dissolution of the corporation.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

BRISTOL, CONN.—E. Ingraham Co., 592 North Main street, manufacturer of clocks, etc., has awarded the general contract for a 5-story manufacturing plant to Torrington Building Co., 182 Church street, Torrington, Conn. (Noted Sept. 20.)

NEW HAVEN, CONN.—Atlas Mfg. Co., manufacturer of sheet metal and wire products, plans to rebuild the part of its plant damaged in a fire Sept. 13.

NEW HAVEN, CONN.—United Illuminating Co., Temple street, has awarded the contract for a power substation, 30 x 80 feet, to B. N. Blatchley Co., 902 Chapel street.

SOUTH NORWALK, CONN.—A 2-story manufacturing plant addition, 70 x 80 feet, is planned by the Nash Engineering Co., Wilson Point road, manufacturer of pumping machinery.

WATERBURY, CONN.—Connecticut Wire Co. has been incorporated with $55,000 capital by Leola M. Barclay, 39 Elm street.

WINSTED, CONN.—A program of expansion has been planned for Winsted Insulated Wire Co.

ANDOVER, MASS.—Phillips Andover academy plans the construction of a power house, 80 x 85 feet. R. D. Kimball Co., 6 Beacon street, Boston, is engineer.

JERSEY CITY, N. J.—American Can Co., 120 Broadway, New York, plans the construction of a 2-story boiler house, 90 x 98 feet.

NEWARK, N. J.—Newark Transformer Co. has purchased a 25 by 100-foot site at 62 Sherman avenue for a new manufacturing plant.

BUFFALO—Madison Wire Works has been incorporated with 1000 shares no par value stock by Timerman & Timerman, Buffalo, attorneys.

BUFFALO—Buffalo Tank Corp. is building a plant on a 5-acre tract at Lincoln avenue and Birch street, Lackawanna, to manufacture tanks for all purposes. The plant is expected to be ready in three months.

DEWITT, N. Y.—New York Central railroad has awarded the contract for towers and power house construction to William M. Ballard Inc.

LONG ISLAND CITY, N. Y.—Takamine Corp., 208 Rawson avenue, manufacturer of electric controls, has acquired additional space to be used for plant expansion.

MAYBROOK, N. Y.—New York, New Haven & Hartford railroad plans to enlarge its engine house and has awarded the contract for the construction work to H. Wales Lines Co., Meriden, Conn.

NEW YORK—New York Edison Co., 130 East Fifteenth street, has awarded the contract for a power plant addition at 701 East Fourteenth street to Kennwell Construction Co., 45 East Seventeenth street.

NEW YORK—Packard Motor Car Co. of New York has awarded the building contract for a sales and service garage building to the Turner Construction Co., 420 Lexington avenue, New York. The building will be 8-stories and basement, 220 x 225 feet. Albert Kahn Inc., Detroit, is architect. (Noted Aug. 30.)

NEW YORK—Board of Health, department of health, 505 Pearl street, plans to build and alter a transformer building and to make light and power house system additions.

ROCHESTER, N. Y.—Automatic Clutch & Machine Co. has been incorporated with 1000 shares no par value stock to manufacture and deal in mechanical devices by Wile, Oviatt & Gilman, Rochester, attorneys.

SODUS, N. Y.—Lamoka Power Corp. has awarded the contract for a power canal, power house and dredging to Dutcher Construction Co., North First street, Fulton, N. Y.

PHILADELPHIA—Work will be started at once by the Philadelphia Rapid Transit Co. on its shop building at Hunting Park avenue and American street.

PHILADELPHIA—York Ice Machinery Co. has received its permit to build a 3-story manufacturing plant, 104 x 200 feet, at Belmont avenue and Thompson street. Contract has already been awarded to Champ & Co. E. H. Poggi is architect. (Noted Aug. 16.)

Resale Equipment News

ASSETS of the Steelcraft Corp. of America, 2341 East Sixty-ninth street, Cleveland, offered at public auction Sept. 20, were bid for by A. V. Cannon, attorney, Union Trust building, Cleveland. The bid is now in the hands of the court, subject to its approval.

* * *

Bids will be received until Oct. 2 by Logan L. Mullins, receiver, 33 South Clark street, Chicago, for the assets of the American Nipple Mfg. Co., 11837 South Peoria street, Chicago. The sale will include the real estate and buildings owned by the company at that address, and equipment and materials in the plant.

* * *

Liquidation sale of the plant of the Warwick Iron & Steel Co., Pottstown, Pa., by Samuel T. Freeman & Co., auctioneers, Oct. 9-11, will include real estate, buildings and equipment. There are six parcels of land, aggregating 183 acres, and 28 brick and frame dwellings. These will be sold the first day. Equipment will be sold the other two days. The latter includes two blast furnaces, with stoves and blowing engines, pig casting machine, sintering plant, three locomotive cranes, four locomotives, cinder ladles, pumps, steel buildings, steel scrap, machine shop and other material.

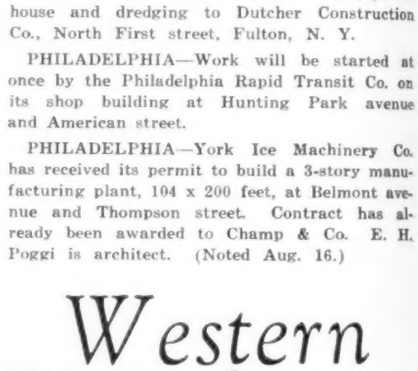
Sales Calender

Oct. 2—Bids to be received for plant and equipment of American Nipple Mfg. Co., Chicago, in receivership.

Oct. 9-11—Warwick Iron & Steel Co. real estate and equipment to be sold at auction in liquidation.

Oct. 11.—Auction of navy surplus and surveyed material at Norfolk, Va., navy yard.

Western States



BISBEE, ARIZ.—Arizona Edison Co., Douglass, Ariz., plans the construction of a steam operated power plant near here.

HUNTINGTON PARK, CALIF.—Byron Jackson Pump Mfg. Co. plans the construction of a 1-story plant addition, 30 x 140 feet, to include a crane runway, and will also remodel its present manufacturing plant unit, 90 x 280 feet.

KAWEAH, CALIF.—Southern California Edison Co., 306 West Third street, Los Angeles, plans the construction of a power house, 3800 horsepower, on the Kaweah river.

LOS ANGELES—Emsco Aero Engine Co., plans to build a new plant and negotiations are under way for property near a municipal airport. The company plans to manufacture large diesel airplane motors.

OAKLAND, CALIF.—Contracts for the hangar to be built at municipal airport have been

awarded to Moore Drydock Co. for steel frame, and to Latourrette-Fical Co. for superstructure other than steel frame.

SOUTH SAN FRANCISCO, CALIF.—Marchetti Motor Patents Inc., Russ building, San Francisco, plans the construction of a motor plant to contain 28,000 square feet of floor space, and an airplane plant to have 69,000 square feet of floor space. A. W. Ryder, Russ building, is architect for the project.

CEDAR CITY, UTAH—Union Pacific railroad has awarded the contract for the construction of a machine shop to Ryberg-Sorensen Inc., Salt Lake City, Utah.

SPOKANE, WASH.—General American Tank Car Corp. has awarded the contract for the erection of the principal buildings of its new plant to the Huetter Construction Co.

TACOMA, WASH.—Barde Steel Co. plans the construction of a branch steel depot here on a recently-acquired site, and the contract for a warehouse has been awarded.

WALLA WALLA, WASH.—Harris Mfg. Co., manufacturer of agricultural implements, has been refinanced and will be known as Harris Harvester Co. in the future. It plans to increase its manufacturing facilities here.

East Central

CHICAGO—Onsrud Machine Works Inc., 3910 Palmer street, has awarded the general contract for a 1-story plant addition, 40 x 100 feet, to Austin Co., 510 North Dearborn street.

CHICAGO—University of Chicago, Blackstone avenue, has let the structural steel contract for a power house and tunnel to Lakeside Bridge & Steel Co.

CHICAGO—Peoples Gas, Light & Coke Co., 122 South Michigan avenue, has awarded the general contract for a 2-story compressor house to Ford & Phillips, 550 West Van Buren street.

CHICAGO—Gay Lo Mfg. Co., 120 South LaSalle street, has been incorporated with $10,000 capital to manufacture in wood and metal novelties, furniture, etc., by George C. Norwood, Leon L. Nave & P. E. Gregory.

CHICAGO—Container Corp. of America, D. R. Hankins, 111 West Washington street, vice president, plans to build a 2-story plant addition. Francisco & Jacobus, 360 North Michigan avenue, are architects.

CHICAGO—Active Pattern & Model Co., 1149 West Harrison street, has awarded the general contract for a 1-story plant addition, 28 x 40 feet, to Industrial Construction Co., 53 West Jackson street.

CHICAGO—Johns Mechanical Products Co., 1642 West Forty-fourth street, has been incorporated with $20,000 capital to manufacture and deal in grinding tools, valve grinding appliances, etc., by Helen and Albert Nowobielski and John Orawiec.

CHICAGO—Kroeschell Boiler Co., 4211 Diversey avenue, has been incorporated with $20,000 in common shares and $150,000 in preferred shares stock to manufacture and deal in boilers, tanks, heaters, etc., by C. A. Rochlitz, Carl H. Kroeschell and Fred Lautenschlager.

Chicago—American Ironing Machine Co., 100 East Ohio street, has been incorporated with $225,000 in preferred shares and 50,000 shares no par value stock to manufacture and deal in laundry machinery and equipment, by W. T. and E. C. Peter and M. J. Broderick.

CHICAGO—General Engineering Works, manufacturer of screw machine products, has purchased 80,000 square feet on West Division street, Chicago, for erection of a 1-story plant, work to begin at once. The proposed building will provide space for increase in the company's business, now at 340 West Huron street, Chicago, and also is to afford room for production of an associated line of products.

FREEPORT, ILL.—Freeport Methodist Hospital association, in addition to the construction of a hospital, sanitarium and laundry, will build a power house, the entire project to be 5-story, brick construction. W. J. Neeley & Co., 417 North Dearborn street, are engineers.

GRANITE CITY, ILL.—Radio Aircraft Corp. plans the construction of an airport to include hangars, shops, etc.

PEORIA, ILL.—Michigan Silo Co., F. A. Dowling general manager, contemplates the construction of a 1-story manufacturing plant addition.

KENDALLVILLE, IND.—Extensions and improvements in the municipal electric light and water plants are planned by the common council. This program also includes a turbine house.

SOUTH BEND, IND.—Dodge Mfg. Co. has awarded the contract for steel for its 1-story plant, 99 x 200 feet, to the Indiana Bridge Co. (Noted Sept. 20.)

SOUTH BEND, IND.—Studebaker Corp. has awarded the contract for its 2-story machine shop, 307 x 427 feet, to R. Sollitt & Son, 518 Sample street. (Noted Aug. 30.)

DETROIT—Fisher Body Corp., 3044 West Grand boulevard, plans the construction of a 1 and 3-story plant.

DETROIT—Carborundum Co., building a warehouse here, has awarded the structural steel contract to the Russell Wheel & Foundry Co. (Noted Sept. 20.)

DETROIT—Oldberg Mfg. Co., 2661 East Grand boulevard, has awarded the general contract for a 2-story manufacturing plant to E. A. Moldenhauer, 18442 Muirland avenue. (Noted Sept. 13.)

DETROIT—Briggs Mfg. Co., 11631 Mack avenue, plans to build a top addition to its Mack avenue plant, and also plans construction at its West side plant. Albert Kahn Inc., 243 West Congress street, is architect for the company.

DETROIT—Detroit Gasket Mfg. Co., 6209 Hamilton avenue, has awarded the general contract for a 1-story boiler house and manufacturing plant to H. Reidinger Co. Inc., 6537 Russell street.

DETROIT—Detroit, Toledo & Ironton railroad has made purchases of property at Lima, O., and plans to centralize its Springfield and Napoleon shops there.

FLINT, MICH.—Chevrolet Motor Co. has awarded the contract for structural steel for a machine shop to Flint Structural Steel Co. (Noted Sept. 20.)

HOLLAND, MICH.—Manufacturers Foundry Co., Eighth and Fairbanks avenue, has been incorporated with $75,000 capital to engage in the general foundry business by Nicodemus Bosch, 189 West Twelfth street.

HOLLY, MICH.—American Spring & Mfg. Co., manufacturer of springs, wire forms, metal stampings, etc., is increasing its loading and shipping facilities.

JACKSON, MICH.—Commonwealth Power Co., building a plant addition, has awarded the contract for structural steel to Wisconsin Bridge & Iron Co.

KALAMAZOO, MICH.—Kalamazoo Stationery Co. plans the construction of a 1-story power plant, 50 x 50 feet, and has awarded the contract to O. F. Miller Co., 224 Pratt building.

LANSING, MICH.—Reo Motor Car Co. has awarded the general contract for an addition to its bus plant, 140 x 700 feet, to Reniger Construction Co., Lansing. The plant is to be completed by Jan. 1. (Noted Sept. 20.)

LANSING, MICH.—Equator Heating Co., 1700 North Turner street, has been incorporated with $25,000 capital to manufacture and deal in oil, gas and coal furnaces, by Carl C. Jaeger, 612 Densmore drive.

LANSING, MICH.—Olds Motor Works has awarded the general contract for the construction of a tool plant to Reniger Construction Co., Lansing. The tool plant is a part of a building program for Olds, previously announced. (Noted Sept. 20.)

MASON, MICH.—Contract for the addition to the plant of the Laboratory Products Co. has been awarded to H. G. Christman Lansing Co. Installation of new boilers also will be undertaken.

MILAN, MICH.—Saco Mfg. Co. has been incorporated with $30,000 capital to manufacture metal and wood products.

SAGINAW, MICH.—Baker-Perkins Co. Inc., C. Pletcher, manager, has awarded the general contract for a foundry addition to James Kerns & Sons, Hess street.

CINCINNATI—Container Corp. of America, 5500 Eastern avenue, has awarded the general contract for a 2-story manufacturing plant to Rust Engineering Co., American Bank building, Pittsburgh.

CINCINNATI—Cincinnati Electric Welders Inc. has been incorporated with $100,000 capital and 4000 shares no par value stock by Lindley G. Palmer, Leo J. Brumleve Jr. and Luella E. Palmer.

CLEVELAND—Cleveland Wire Spring Co., building a plant addition, has awarded the contract for structural shapes to T. H. Brooks Co. (Noted Sept. 6.)

CLEVELAND—Forest City-Walworth Run Foundries Co., will rebuild the building burned in a fire Sept. 16. The new building will be used for a finishing and shipping plant. (Noted Sept. 20.)

CLEVELAND—Eaton Axle & Spring Co., to build an addition to its 140th street plant, will soon award the contract for structural steel, according to plans prepared by George S. Rider, engineer. (Noted Sept. 20.)

CLEVELAND—Peerless Motor Car Corp., East Ninety-third street, has awarded the general contract for a coal storage building and a boiler house to H. K. Ferguson Co., Hanna building, Cleveland. (Noted Sept. 6.)

CLEVELAND—Construction work will start

shortly for the new manufacturing plant for Cloyes Gear Works which will move from its present location at 1614 Collamer street. The new building will be erected at Roseland and Arabella roads and will give the company three times its present space.

DAYTON, O.—East Dayton Tool & Die Co. has been incorporated with 250 shares no par value by William Schleman, Lawson S. Hadley and Robert C. Renner.

NORWALK, O.—The rebuilding of the portion of the plant of the Norwalk Drilling Tool Co. damaged by fire a month ago is nearing completion.

NORWALK, O.—Frederick Machine Works has completed one addition to its plant and contemplates the construction of another in the spring.

PAINESVILLE, O.—City of Painesville is rehabilitating its municipal light plant and has awarded a contract to Mitzel Co., B. F. Keith building, Cleveland.

TIFFIN, O.—Hanson Clutch & Machinery Co. plans the construction of two additions to its plant next spring, to be used for the production of machinery parts. Two additions are nearing completion now and will be used for the assembly of excavating machinery.

BEAVER DAM, WIS.—Wisconsin Light & Power Co., 16 North Carroll street, Madison, Wis., has let the contract to the Hutter Construction Co., 128 Western avenue, Fond du Lac, Wis., for a new boiler house and radial brick stack, and will install a 500-horsepower boiler.

BELOIT, WIS.—O. A. Halls has plans by Architect Frank A. Carpenter, Brown building, Rockford, Ill., for a machine shop and automobile service and repair station, 73 x 100 feet, on Pleasant street, opposite the Hotel Hilton.

JANESVILLE, WIS.—Northern Conveyor Co., manufacturer of contractors' conveying equipment, plans to build shop addition to double the company's present capacity. G. W. Whitnall is secretary.

KENOSHA, WIS.—Nash Motors Co. has awarded the contracts for new buildings at the manufacturing plant in Racine, Wis., consisting of a new wheel room, body storage plant and additions to the ovens, forge and heat treating building and power plant. The general contractor for the construction work is Nelson & Co. Inc.

MADISON, WIS.—Arthur Peabody, state architect, is completing plans for the new mechanical engineering building at the University of Wisconsin, for which purpose an appropriation of $577,000 is available. Plans will be ready about Nov. 1, and bids will be taken about Nov. 15. M. E. McCaffrey is secretary of the board of university regents.

MADISON, WIS.—Wisconsin Power & Light Co., 16 North Carroll street, is taking estimates on two 600-kilovolt ampere generators, two 750 horsepower turbines and other equipment for a proposed $150,000 hydroelectric power plant on Rock river at Rockton, Ill. The building will be 20 x 80 feet. Equipment will be purchased before contracts are let for the power house. The engineers are Mead & Seastone, Madison.

MILWAUKEE—Seaman Body Corp., 1732 Richards street, has awarded the general contract for its 5-story plant addition to Bahlman Construction Co., 456 Broadway. (Noted Sept. 20.)

PESHTIGO, WIS.—Thompson Bros. Boat Co., maker of steel and metal rowboats, canoes and power boats, will build a 1-story addition, 100 x 160 feet.

RACINE, WIS.—Nash Motors Co. has awarded the structural steel contract for a plant addition to Worden-Allen Co. (Noted Aug. 2.)

WASHBURN, WIS.—Washburn Motor Co. plans a 1-story garage and repairshop, 50 x 100 feet, at Bayfield street and South Second avenue. S. I. Haugen is proprietor.

WISCONSIN RAPIDS, WIS.—Prentice-Wabers Products Co., gasoline camp cook stoves, tables, chairs, etc., is starting work on a 1-story addition, 70 x 176 feet, to cost about $40,000 with complete equipment. R. S. Wiltrout is general manager.

West Central

WICHITA, KANS.—Stearman Air Craft Co. contemplates the construction of a 1-story hangar, to be built at the Wichita airport.

CLAYTON, MO.—St. Louis county plans to build a power plant as part of a hospital development.

PIEDMONT, MO.—Arkansas-Missouri Power Co. plans to build an addition to its power plant, 56 x 56 feet, and will also install an oil type engine.

SPRINGFIELD, MO.—Springfield National Guard plans the construction of a complete airport.

ST. LOUIS—Construction of an electrolytic zinc plant in St. Louis is planned by Evans-Wallower Lead Co., Joplin, Mo.

ST. LOUIS—A. Leschen & Sons Rope Co., 5909 Kennerly avenue, has awarded the contract for a 2-story boiler and engine house addition at its wire rope plant to Hume-Deal Co., 777 Arcade building. (Noted Sept. 20.)

LINCOLN, NEBR.—Missouri Pacific railroad plans to rebuild its roundhouse damaged in a recent fire.

Southern States

MOBILE, ALA.—City of Mobile is considering the advisability of constructing a municipal power plant, primarily for the operation of water works.

PARIS, ARK.—The city will vote shortly on bonds to provide for extending the power plant.

JACKSONVILLE, FLA.—City of Jacksonville contemplates building a municipal machine shop, 1-story, 30 x 125 feet. John Fowler is city clerk.

MIAMI, FLA.—A site of 100 acres has been acquired by the city for its airport. Border lights and flood lights will be installed and bids soon will be taken for a hangar, 90 x 100 feet.

MIAMI, FLA.—Pan American Airways Inc. has plans for a hangar, 100 x 120 feet on 130 acres, acquired recently.

AUGUSTA, GA.—Babcock & Wilcox Co. has awarded the grading contract for its 1-story boiler plant to H. C. Morrison & Co., 112 Eighth street. (Noted Aug. 23.)

NEW ORLEANS, LA.—Public Belt railroad plans improvements, including extension of lines and enlargement of shops.

OXFORD, MISS.—Contract for a power house building, 40 x 72 feet, has been awarded by the city to W. R. Ellis, Clarksdale, Miss. Frank P. Gates Co., Edwards hotel, Jackson, Miss., is architect.

HENRYETTA, OKLA.—City has awarded the contract for the construction of a power house and purification plant to George M. Brown & Co., McAlister, Okla.

CHATTANOOGA, TENN.—Crane Co., 836 South Michigan boulevard, contemplates establishing a plant here for the manufacture of radiators.

CHATTANOOGA, TENN.—Meehanite Metal Wheel Co. has been incorporated with $25,000 capital to manufacture metal wheels from cast iron products, by a patented process, by C. A. Noone, First National Bank building.

ABILENE, TEX.—West Texas Utilities Co. has started building of 27 miles of new transmission line to serve industries at Brady, Tex., and adjacent communities. Substations will be constructed at Melvin and Brady.

AMARILLO, TEX.—A $100,000 bond issue for the establishment of an airport was recently voted by the city.

AUSTIN, TEX.—City of Austin plans to establish an airport on 340 acres of property it contemplates acquiring.

BEAUMONT, TEX.—Beaumont Armature Works has been incorporated with $4000 capital by H. W. Gardner, 869 Calder avenue, Ernest Fuchs Jr. and Emile Heinrich.

BEAUMONT, TEX.—Kansas City Southern railroad plans property improvement to include new 8-stall addition to roundhouse, machine shop, power house and turntable.

CORSICANA, TEX.—Texas Pipe Line Co. has started construction of an 8-inch welded line to San Augustine, Tex., and will increase capacity of Corsicana pump station by addition of two 18,000-barrel capacity pumps. Oil engine power will be utilized in place of steam.

DALLAS, TEX.—William E. Easterwood Jr., 519 South Akard street, plans to establish an airplane plant.

EDCOUCH, TEX.—Edcouch Machine & Electric Co. plans to build a 2-story machine shop on Santa Rosa avenue. Stone & Phillips, Weslaco, Tex., are contractors for the construction.

FORT WORTH, TEX.—Texas-Worth Tool Co., W. H. Eason, Tonkawa, Okla., manager, has leased a building at 2400 West Seventh street, to manufacture and repair oil field tools.

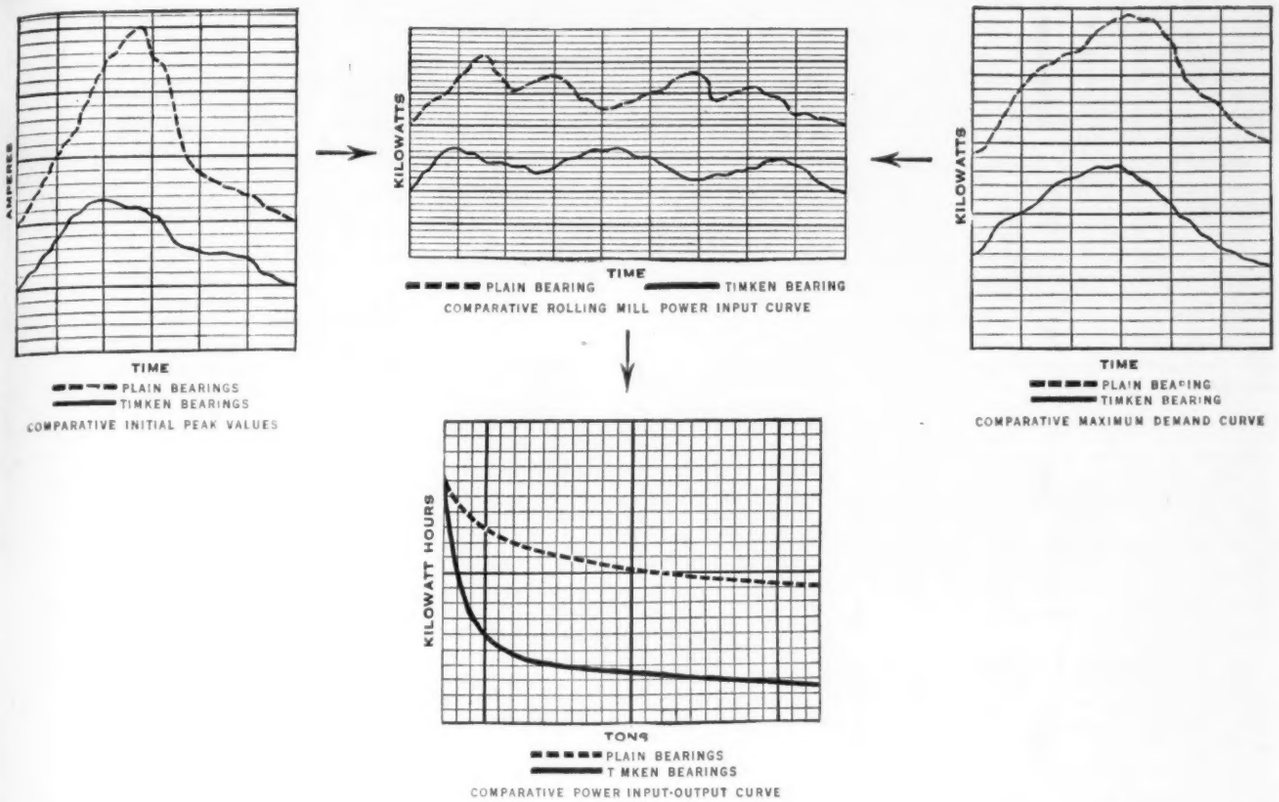
FOR WORTH, TEX.—City council is negotiating for purchase of 35 acres adjoining municipal airport, with view to enlargement.

FORT WORTH, TEX.—American Mfg. Co., Weatherford, plans to remove the remainder of its machinery to its auxiliary plant at Hodge Station.

GRAHAM, TEX.—Bolin Tool Co. has been

(Concluded on Page 824)

INTEGRATED!



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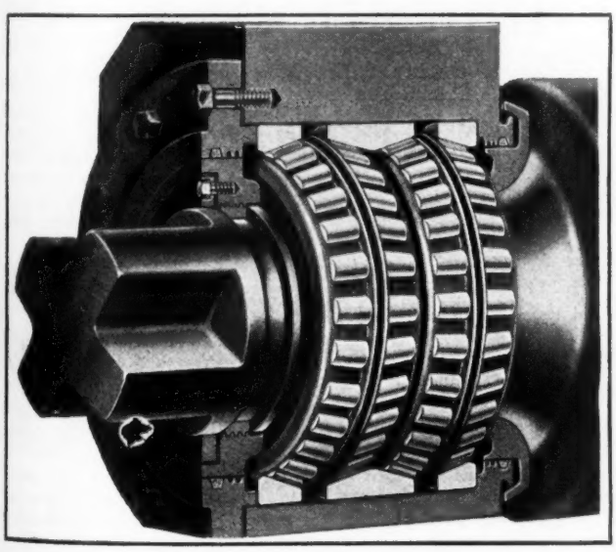

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Construction and Enterprise

(*Concluded on Page* 824)

incorporated with $20,000 capital by D. H. Bolin and R. W. Lindsey.

HOUSTON, TEX.—Texas Electric Steel Castings Co., 1515 Spring street, has awarded the contract for a 1-story building to Lamella Trussless Roof Co.

M'ALLEN, TEX.—City commissioners are contemplating the purchase of land for the establishment of an airport.

PORT ARANSAS, TEX.—Humble Oil & Refining Corp. will enlarge its refinery at Ingleside by addition of three new stills and a cracking plant.

SAN ANGELO, TEX.—An airport will be established here on a 250-acre site and the necessary building, to include hangars, shops, etc., will take place immediately.

SAN ANTONIO, TEX.—San Antonio Drilling Equipment Co. has been incorporated with $50,000 capital by D. C. McBride, 122 Kennedy street, Russell H. Giesey and John L. Stevens to manufacture and distribute oil field tools.

SAN ANTONIO, TEX.—Milam Chevrolet Co., 1435 Main street, is inquiring for machinery and equipment for general automotive repairing for its proposed 2-story garage and sales building.

SMITHVILLE, TEX.—Missouri-Kansas-Texas railroad, St. Louis, soon will award the contract for improvements to its locomotive terminal facilities including roundhouse, machine shop, etc.

TAYLOR, TEX.—Taylor Iron Machine Works, captial $15,000 has been chartered by J. W. Manda and Clyde Rhodes.

WHITEWRIGHT, TEX. — Texas-Louisiana Power Co. is building a generating plant, 50 x 92 feet, and will install two 560-horsepower oil units direct connected to 450-kilowatt generators as power equipment. A. C. Allen is construction superintendent in charge.

CLARENDON, VA.—Arlington Airways Inc. has been incorporated with $25,000 capital to manufacture airplanes and equipment by B. M. Hedrick.

RICHMOND, VA.—Virginia-Carolina Power Co., 700 East Franklin street, plans a hydroelectric development and will build a power house near the mouth of Polar creek. Stone & Webster Inc., 49 Federal street, Boston, is engineer.

Canada

EDMONTON, ALTA.—Triumph Motor Car Works of Canada Ltd. has been incorporated to manufacture and deal in automobiles, motors, engines, machines and machinery with 50,000 shares no par value stock by George H. Michaud, Eugene J. deHart and Neville White.

HAMILTON, ONT.—Wright Metalwares Ltd. has been incorporated with $40,000 capital and 2000 shares no par value stock by Ewart G. Dixon, Norman W. Byrne and George P. V. Shaver.

HAMILTON, ONT.—International Harvester Co. of Canada Ltd., Sherman avenue north, has awarded contract to Humphrey Bros., 214 Wellington street east, for the erection of a foundry addition, 1-story, 60 x 120 feet. The Hamilton Bridge Co. has the steel contract.

PETERBOROUGH, ONT.—City council contemplates purchasing two pumps for intermitant pumping station at Maurice and Smith streets plant.

ST. CATHARINES, ONT.—Haney Repair Service Ltd. has been incorporated to manufacture and deal in automobiles, aircraft, motors, etc., with $60,000 capital by Fonce V. Haney, Fred S. Pattison and Robert B. Johnston.

THOROLD, ONT.—Walker Bros. are inquiring for a second hand steam engine, 50 to 75 horsepower.

TORONTO, ONT.—Johnston Welding & Radiator Co., 2692 Dundas street west, will build an addition to its plant and is interested in tools and general equipment for same.

TORONTO, ONT.—Bendix Brakes Ltd. has been incorporated to manufacture and deal in automotive and other vehicular brakes, wheels, and equipment with $25,000 capital by Newton M. Young, Edward N. Jory, and Roy H. Elmhurst.

TORONTO, ONT.—Car-Kra Ltd. has been incorporated to manufacture and deal in window sashes, fixtures, machinery, tools and implements, with $50,000 capital and 10,000 shares no par value stock by Charles P. Tisdale, Edward J. B. Duncan and George H. Gilday.

TORONTO, ONT.—Radio Merchandisers Ltd. has been incorporated to manufacture and deal in electrical, automotive and radio machinery, equipment and appliances, with $200,000 capital by Henry G. Donley, John E. Prichard and Frederick G. Fitzgerald.

TORONTO, ONT.—Canadian Accousticon Ltd. has been incorporated to manufacture and deal in dictographs, motor dictaphones, accousticon instruments, etc., with $10,000 capital stock by Richard W. Hart, Charles H. C. Leggott and Edna Fitzsimons.

TORONTO, ONT.—General Steel Wares Ltd. has obtained a site at North Bay, Ont., where it will construct a branch establishment, to include an assembling plant, distributing warehouse and the district offices of the company's sales force.

TORONTO, ONT.—Northwestern Power Co. has been granted a 30-year lease of the Seven Sisters Falls power site. The Northwestern company is a subsidiary of the Winnipeg Electric Co.

HULL, QUE.—Mississippi Iron Works Ltd., Almonte, Ont., proposes to move its plant to this city, in connection with which it will erect a new plant on Montcalm street here.

MONTREAL, QUE.—Red Seal Home Appliances Ltd. has been incorporated to manufacture and deal in machines, machinery apparatus and appliances, with 10,000 shares no par value stock by Claude S. Richardson, Francis G. Bush and William P. Creagh.

MONTREAL,QUE.—Dominion Bridge Co. has obtained a contract for the erection of a lift bridge on the Welland canal at Welland, Ont., with Westinghouse electric equipment. The Canadian Iron Foundry has a contract for guard work at the same point.

ROSETOWN, SASK.—Canadian Utilities Ltd., operator of the power plant here, plans extensions and improvements. Among the proposed improvements is installation of a new diesel engine.

New Trade Publications

LUBRICATION—Bassick Mfg. Co., Chicago, gives various applications of its lubricating devices in the current number of its house organ. Numerous installations in actual service are featured.

PORTABLE ELEVATORS—Revolvator Co., Jersey City, N. J., has issued a bulletin describing its revolvable base, enclosed gears and splash system lubrication. Details of these features are illustrated.

FUEL OIL—Oil Heating Institute, New York, is distributing a booklet discussing the question of the supply of fuel oil. It assumes from data available that the supply will be sufficient for many generations and no shortage can be expected for a long time.

WELDING—The influence of manganese in steel welding rods is discussed in a bulletin by the Fusion Welding Corp., Chicago. The bulletin also describes a portable welder driven by a gas engine, which can be towed by an automobile to any location. It is mounted on rubber-tired wheels and is self-contained.

MILLING CUTTERS—Goddard & Goddard Co., Detroit, has issued a booklet on inserted tooth cutters and taper dovetail blades. It is illustrated to show how the blades are proportioned tc give best fit in holders and assure easy removal. Various forms of cutting tools with inserted teeth are shown.

FORGINGS—National Machinery Co., Tiffin, O., in the current number of its series of bulletins, calls attention to internal displacement forgings made on its machines. Minimum weight and minimum finish forgings produced by these machines are claimed to be unusually economical.

ALLOY CASTINGS—Sivyer Steel Casting Co., Milwaukee, in a current bulletin calls attention to its method of making alloy steel of the proper analysis in the furnace rather than in the ladle, to obtain uniform results.

MANGANESE STEEL—American Manganese Steel Co., Chicago, is distributing a leaflet devoted to new applications of manganese steel and other alloys and products of this company. It is illustrated to show these applications.

SPIEGELEISEN—New Jersey Zinc Sales Co., New York, has issued a booklet on spiegeleisen. In addition to description of this alloy a table is given showing the equivalent value of spiegeleisen and 80 per cent ferromanganese.

HEAT TREATMENT—In a current bulletin the Stanley P. Rockwell Co., Hartford, Conn., discusses the importance of time control in heat treatment where distortion is detrimental. An illustrative example is taken and the result of following the company's plan is described.

It does turn out the work!

Bethlehem Special High Speed Tool Steel is the result of many years of research and experiment, conducted with the object of developing a tool steel to stand very heavy cuts at unusually high speeds.

This steel is a high-speed tool steel for use in heavy-duty tools for lathes, planers, boring mills, or other similar machine tools. It also gives excellent results in twist drills, milling cutters, taps, reamers, gear cutters, inserted saw teeth, special dies, wood-working tools, punches and dies. It is remarkably uniform in its cutting qualities. At its forging heat it can readily be formed into intricate tools; it is easily annealed.

If you have never used Bethlehem Special High Speed Tool Steel it will pay you to try it. You will soon be convinced that this steel is unexcelled in its endurance and cutting power —in its ability to turn out the work.

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

DISTRICT OFFICES

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh Buffalo Cleveland
Detroit Cincinnati Chicago St. Louis San Francisco Los Angeles Seattle Portland Honolulu

Bethlehem Steel Export Corporation, 25 Broadway, New York, Sole Exporter of our Commercial Products

BETHLEHEM
Special High Speed TOOL STEEL

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	26½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	28½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾-inch	30	13
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 3-inch	26	11
3½ to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾-inch	30	14
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh carload discounts. Less carloads 4 points less

STEEL (Lap Weld)

2 and 2¼-inch	27 off
2½ and 2¾-inch	37 off
3-inch	40 off
3¼ to 3¾-inch	42½ off
4 to 13-inch	46 off

(Note—Additional discounts of seven extra 5 per cents now being given on 21,000 pounds or more.)

CHARCOAL IRON

1½-inch	+18
1¾-inch	+ 8
2 and 2¼-inch	2 off
2½ to 3-inch	7 off
3¼ to 4½-inch	9 off

(Note—Additional discounts of two 10's and one 2½ now being given on 12,000 pounds or more.)

SEAMLESS COLD DRAWN

1-inch	63 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48 off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	45 off

SEAMLESS HOT ROLLED

2 and 2½-inch	40 off
2½ and 2¾-inch	48 off
3-inch	52 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot. Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.30c
Over 96 inches to and including 100 inches	.80c
Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.	

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot	.20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot	.20c
Plates ordered 7.65 pounds per square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. specifications, classes A and B	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c